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Going Against a Pandemic: Persuasive Messages on Benefits for the Common Good or Individuals to Encourage Data Disclosure to Disease Spread Apps

Navn: Camila Sneli Mørch

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## Summary

Currently, the world is experiencing the COVID-19 pandemic. The widespread virus has motivated the development of monitoring systems that identify those infected by COVID-19 to warn whoever has been in contact with infected individuals. A much-discussed monitoring system in the fight against the virus has been mobile disease spread applications. The apps are succeeding in various countries but failing in others. Predicted causes to the failure are reactance and privacy concerns. Thus, this study aims to understand how countries can overcome privacy concerns and reactance to develop persuasive messages which increase attitudinal- and behavioural intention to adopt a disease spread app.

In the first part of the thesis are the hypotheses developed, and the conceptual framework is set up. It is predicted that behavioural intention to disclose personal data to a disease spread app is larger when an individual is presented with a persuasive message on the common good benefits of disclosing the data, relative to a focus on personal benefits of disclosing. A chain-of-effects driving behavioural intention are predicted, which begins with threat to freedom or trait proneness that increases reactance. These chains are moderated and increased by fear. Next, reactance decreases attitudinal intention to disclose. These mentioned chains' magnitudes are larger for those presented the personal benefits message, compared to those presented with the common good benefits message. Lastly, attitudinal intention increases behavioural intention to disclose. This final chain is larger for those presented the common good benefits message. Except, this final chain could be negative when the chain-of-effects starts from trait proneness. Thus, it would be smaller for the common good benefits message. All predictions were supported, except fear and the final chain was found to be positive for trait proneness.

In the final part of the thesis is the methods section. An experimental design was used with two conditions and persuasive messages, which solely differed in message topic: common good or personal benefits of disclosing personal data to a disease spread app. After participants were presented a message, they were shown questions and measures to test the predictions and hypotheses. A convenience sampling method was used, and after data cleaning, there were 296 participants. To decide when behavioural intention is larger, a one-way analysis of variance was run, and to find the chains' magnitudes and directions, PROCESS macro was used.

## 1.0 Introduction

Smart cities bring benefits to the common good and individuals through technology and collecting health data about citizens (Purtova, 2016). For example, there are newer smartwatch models with fall detection (Mills, 2020). If somebody suffers a hard fall, the watch can assist them in contacting an emergency line quickly and easily (Mills, 2020). The flipside of the coin is privacy issues that emerge as data is collected (Zoonen, 2016). Governments must do both: protect the privacy of citizens and improve the efficiency of technology. A current issue that put governments to the test and that underlines the importance of this topic is the current COVID-19 pandemic (BBVA, 2020).

The pandemic has motivated governments worldwide to develop monitoring systems, as through mobile disease spread applications (hereafter referred to as disease spread apps), that identify those infected by COVID-19 to warn whoever has been in contact with infected individuals (Wels-Maug, 2020). In multiple places, the apps are performing below a satisfactory level. The reasons why are that people are not sharing with the apps that they are infected, people are not downloading the app, privacy issues occur, or the technology is not satisfactory enough (FRANCE 24, 2020; Babones, 2020; Datatilsynet, 2020; Burgess, 2020; Bradshaw, 2020; Red Herring, 2020; BBVA, 2020). This implies that many are not contributing to the common good as they do not share whether they are infected, or they do not ensure that they are not around somebody infected not to spread the disease. Furthermore, many lose out on the personal benefits of sharing their data. The common good is defined as advantages to society as a whole, while personal benefits are advantages received on an individual level.

Nevertheless, prior studies convey that many in Norway and the United States are open to sharing health data for the common good (Manis, 2018), but many Norwegians expressed that they then would want their privacy to be maintained (Vinsrygg, 2019). Moreover, in other European countries and the United States, people have expressed that they want their privacy concerns to be maintained for them to adopt a disease spread app (Scarpetti et al., 2020; Perrigo, 2020). Yet, research on privacy concerns suggests that people tend to share data when sharing data leads to immediate personal benefit, although it may jeopardize their privacy (Acquisti et al., 2013; Zoonen, 2016). For instance, an individual may disclose data

to a disease spread app to obtain control of whether they are in close contact with an infected individual and thus should go in quarantine. Furthermore, if an individual becomes infected and understands that they can contribute to the common good by conveying their locations to others through the disease spread app, they could become altruistic and motivated to disclose their infection to the app. Though, privacy concerns may yet occur. For example, individuals may believe that others can identify them by examining their location trails (Raskar et al., 2020). To therefore avoid social stigma, they may be motivated not to disclose data to a disease spread app (Raskar et al., 2020). No matter the possible personal or common good benefits.

Hence, privacy concerns associated with disease spread apps can threaten individuals' freedom to privacy and motivate them to not adopt disease spread apps, neither as a healthy or infected individual. Therefore, reactance appears to be a factor to why people are not disclosing enough data to COVID-19 disease spread apps, and it is crucial to understand how this issue can be circumvented. Reactance entails that when a person perceives a threat or loss to their freedom, then they experience psychological reactance – an unpleasant reaction –, which may motivate them to recover their freedom (Brehm & Cole, 1966). Health communication researchers have found that reactance explains why health campaigns many times fail (Quick et al., 2011).

After an extensive search, no studies are found on, and thus this study aims to understand, the difference in strength of behavioural intention to disclose personal data to a disease spread app, when people are shown a persuasive message focused on common good benefits or personal benefits of disclosing personal data to a disease spread app. The behavioural intention is expected to be larger for those presented the common good benefits message. The reasons why this is expected is discussed in detail in section 4.0. Among other things are the reasons that altruistic motivations are expected to occur when people are presented the common good benefits message, or because multiple Western nations with the most successful disease spread apps, focus more on common good benefits than personal benefits in persuasive messaging. The findings from this study can be replicated and benefitted from in marketing of disease spread apps, because the results can convey whether persuasive messaging focused on common good benefits or personal

benefits of disclosing personal data to a disease spread app is more effective in increasing disease app adoption.

Moreover, after a wide search, no reactance studies are found on whether there is a reactance process driving behavioural intention to disclose personal data to a disease spread app. Therefore, there are no reactance studies examining how the reactance process would look like or differ when individuals are presented a persuasive message focused on personal benefits of disclosing personal data to a disease spread app, or the common good benefits. Thus, this thesis aims to understand whether the reactance process drives behavioural intention to disclose to a disease spread app, and if the reactance process is present, how it would look like and differ between those presented a personal benefits message or a common good benefits message.

This thesis does predict that there is a reactance process driving behavioural intention to disclose personal data to a disease spread app. In addition, the process is predicted to start when an individual is presented with a persuasive message focused either on personal or common good benefits of disclosing personal data to a disease spread app. The process is predicted to begin with threat to freedom of privacy or trait proneness that increases reactance. Threat to freedom of privacy entails that an individual experiences that their freedom to have privacy is threatened. Trait proneness is an individual's proneness level for experiencing reactance due to a stimulus (Brehm & Brehm, 1981; Shen & Dillard, 2005b). Subsequently to trait proneness and threat to freedom affecting reactance, reactance then is predicted to decrease attitudinal intention to disclose personal data to a disease spread app. Lastly, attitudinal intention is expected to increase behavioural intention to disclose. As behavioural intention is expected to be larger for those presented the common good benefits message, the reactance process' path magnitudes between variables preceding attitudinal intention, are expected to be larger for those presented the personal benefits message, relative to those presented the common good benefits message. While the path between attitudinal intention and behavioural intention is expected to be smaller for the personal benefits message, relative to the common good benefits message. Though, when the process starts with trait proneness, the path between attitudinal and behavioural intent can be negative and thus is smaller for the common good benefits message. The findings



will contribute to the health communication and reactance literature as few have studied reactance in health marketing (Amarnath & Jaidev, 2020).

## **2.0 Reactance to Disclose Personal Data**

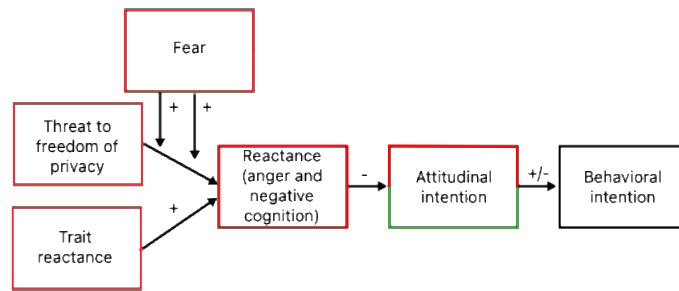
The first main research area of this thesis is to discover the difference in strength of behavioural intention – to disclose personal data to a disease spread app – between people who are presented a persuasive message focused on personal benefits of disclosing – personal data to a disease spread app – or common good benefits of disclosure. A disease spread app is an app aimed at limiting the spread of a virus. The apps track infected individuals to warn app users (Raskar et al., 2020). For the apps to warn users of having been or of being close to infected individuals, the infected must be registered in the disease spread app. Either the infected voluntarily share with the app that they are infected (Zimmermann & Karapetyan, 2020), or they have no say; thus, the government shares the data without their permission (Sieren, 2020).

The behavioural intention is predicted to be larger for those presented the common good benefits message. Among other things due to altruistic motivations, or that many places in Europe or North America with the most successful COVID-19 disease spread apps have focused more in their previous promotional messages on common good benefits than personal benefits. For example, in the United States, Virginia and Delaware have the highest disease app adoption rate, where Delaware has a lower adoption rate (Garza, 2020). After a broad search, Virginia's disease spread app promotional messages focus more on the common good, while the messages for Delaware's app focus more on personal benefits. The reasons why intention is predicted to be larger for those presented the common good benefits message is discussed more in detail in section 4.0. Additionally, it can be crucial that the persuasive messages deal with privacy issues for people to adopt a disease spread app, which this study attempts in the methodology. For example, individuals may become loss averse and diminish altruistic motivations if they have crucial privacy concerns.

The second main research area in this thesis is whether the reactance process drives behavioural intention to disclose personal data to a disease spread app, and how the reactance process would look like and differ between people presented a persuasive

message about the common good or personal benefits of disclosing personal data to a disease spread app. It is anticipated that after people are presented with one of the persuasive messages, they experience a threat to their freedom of having privacy, and they experience trait proneness. As aforementioned in the introduction, *trait proneness* is peoples' proneness level for undergoing reactance due to a stimulus, and *threat to freedom of privacy* means that somebody feels that their freedom to have privacy is threatened. Threat to privacy is often studied as a cost of data disclosure (Bol et al., 2018; Acquisti et al., 2013; Angst, 2010; Derlega, 1993).

After people are presented with a persuasive message, the experienced threat to freedom of privacy or trait proneness is predicted to positively influence and increase reactance. These paths are positively moderated and increased by the variable fear. Next, reactance is expected to decrease attitudinal intention to disclose personal data to a disease spread app with a negative direction, and then attitudinal intention is expected to increase and positively influence behavioural intention to disclose. The path from threat to freedom or from trait proneness to reactance, and the path between reactance and attitudinal intention, is expected to be larger for those presented the personal benefits persuasive message, relative to those presented the common good benefits message. The reason why is that behavioural intention is expected to be larger for those presented to the common good benefits message, which is further discussed in section 4.0 and its belonging subsections. The path from attitudinal intention to behavioural intention is thus expected to be larger for those presented the common good benefits message, relative to those presented the personal benefits message. However, when the proposed reactance process starts with trait proneness, the path from attitudinal to behavioural intention may be negative and thus decrease behavioural intention. In that case, the path would be smaller for those presented with the common good benefits message, relative to the personal benefits message. This proposed reactance process' structure is in line with most prior research, which is further reflected on in-depth in section 5.0 and 4.0, with 4.0's subsections. Figure 1 below illustrates the proposed reactance process driving behavioural intention to disclose personal data to a disease spread app.



**Figure 1** The predicted reactance process.

*Note.* Fully red boxes convey that these variables overall have a negative indirect effect on behavioural intention as it indirectly decreases it. A half-red and half-green box conveys that attitudinal intention either has a positive or negative direct effect on behavioural intention.

To set up the reactance process, it is crucial to decide how to define reactance in the process, which is focused on next. In 1966, American psychologist Jack Brehm first proposed the social psychological theory coined reactance theory (Amarnath & Jaidev, 2020; Lessne & Venkatesan, 1989). From then to today, a myriad of studies on reactance has been published within various fields, among others in marketing (Steindl et al., 2015). Brehm and Cole (1966) originally defined reactance as when a person perceives a threat or loss to their freedom, and then they may experience psychological reactance, which may motivate them to recover their freedom. Their definition remains (American Psychological Association, n.d; Steindl et al., 2015). Hence, reactance can prevent individuals from being influenced (Steindl et al., 2015). Additionally, for reactance to occur, individuals need to be conscious of a freedom being an actual freedom, and they need to believe that they can perform the freedom (Berger et al., 2009).

Although Brehm and Brehm in 1981 stated that reactance cannot be measured directly, since the 2000s, a growing amount of research has been done on emotions associated with threat to freedom (Steindl et al., 2015). Shen & Dillard (2005b) have been particularly influential in their findings that reactance is a combination of emotion and cognition, and reactance is a second order construct including the latent variables anger and negative cognition associated with anger (Steindl et al., 2015; Rains, 2013; Rosenberg & Siegel, 2018; Ratcliff, 2019). Their measure of reactance as a second order construct is known as the intertwined model. This model is included in Figure 1, and it is used to measure reactance in the later main analyses. Furthermore, literature reviews suggest further research to explore other emotions'

possible relation to reactance (Amarnath & Jaidev, 2020; Rosenberg & Siegel, 2018), such as fear (Rosenberg & Siegel, 2018). Fear could affect reactance in the proposed process because people may feel fear when having privacy concerns (Gu et al., 2017; Degirmenci, 2020). Therefore, fear was tested as a moderator of the path between trait proneness or threat to freedom and reactance, which can be observed in Figure 1. The moderator was predicted to influence reactance positively and increase it. Emotions and cognition in relation to reactance are reflected on more in-depth in section 4.3.

### **3.0 Differentiating between Common Good Benefits and Personal Benefits**

Personal benefits and benefits for the common good are defined differently (Angst, 2010). The common good is a broad term defined as advantages to society as a whole, rather than on an individual level (Lee, 2016). For example, it is the concept behind city parks, which can be enjoyed by the public (Angst, 2010). Though, the term can be further narrowed down. Firstly, relevant data can be utilized to advance scientific research, which can bring increased efficiency of health-related technology (Sharon, 2018), as for disease spread apps. Secondly, when people share relevant data with a disease spread app, it can contribute to individual and collective well-being by helping others and oneself to be healthy (Roy et al., 2018). For example, to provide one's location to a disease spread app for the app to monitor whether one has been near an infected. However, data disclosure for the common good can come with perceived personal costs and threat to freedom, which is privacy in this study (Bol et al., 2018).

Personal benefits are advantages received by an individual, rather than society as a whole (Liang et al., 2018). For example, a disease spread app's potential personal benefit is to lessen the fear of becoming infected if an individual cannot stay at home much due to work. To disclose data to a disease spread app for personal benefit can come at perceived personal costs and threat to freedom, which is privacy in the context of this study (Martin & Murphy, 2017; Wang et al., 2016). Although this study separates between personal benefits and common good benefits, benefits can be both personal and for the common good (Liang et al., 2018). For example, if a disease is more under control, people can on an individual and societal level enjoy the benefit of moving more freely with less worry during a pandemic.

To make accurate predictions in terms of the main research areas of this study, it is crucial to inspect prior research on persuasive messages' effect on intention and the reactance process. However, prior studies of messages' influence on reactance have primarily concentrated on outcomes associated with personal benefits, rather than benefits for the common good (Liang et al., 2018). The following findings became primarily relevant in designing the messages, or in identifying control variables for the analysis later in this thesis, rather than for generating the hypotheses.

Concerning previous research on personal benefit-oriented messages in relation to reactance and intention. Numerous prior findings are consistent in that the higher levels of expressed control over the message receiver, and the higher threat to someone's freedom, then it leads to higher reactance and thus failure in intention and persuasion (Steindl et al., 2015; Amarnath & Jaidev, 2020). This occurs although there are personal benefits to be persuaded by the message (Liang et al., 2018; Shen & Dillard, 2005b). Thus, when a message promotes the personal benefits of an attitude or a behavioral intention, findings suggest that it should have low levels of threat to freedom and controlling language. These insights are relevant for message design in this study's methodology.

Regarding previous research on messages focused on the common good in relation to reactance and intention, Liang et al. (2018) studied the effect of water conservation messages – that among other things focused on societal benefits – on threat to freedom and reactance. Their findings were that reactance increases if the message focuses on loss on a societal and personal level, but the effect could be reduced by providing evidence to encourage water conservation. Additionally, they found that reactance decreases if the message focuses on tips or strategies to contribute to water conservation. Furthermore, they found that the level of threat to freedom and reactance negatively influences attitudinal intention to conserve water, and the attitudinal intention positively influences actual behavior to conserve water, which is in line with this thesis' predictions. The discoveries in this paragraph are primarily relevant for message design in this study's methodology.

In another study, Xu (2019) found that common good messages focused on loss increases reactance. Xu studied this in charity advertising with persuasive messages that benefit the well-being of society and individuals. In addition, Xu (2019) found

that a loss appeal is not more effective than a gains appeal in influencing peoples' intent to donate. However, Cho and Sands (2011) found that if a message is short, a gains frame is less likely to increase reactance than a loss frame. Additionally, Bruns et al. (2018) found support to that nudges in general can be effective in influencing individuals to contribute to environmental protection. They generalized that nudges can be used to promote and increase contributions to the public good. The findings in this paragraph are as well mainly relevant for message design in this research's methodology.

A research suggestion, which is as well relevant for message design, is about punishment and rewards. On the one hand, punishments can be implemented to prevent an undesired behavior. On the other hand, rewards can be implemented to encourage a desired behavior (Mulder, 2016). For instance, punishment or reward for choosing personal benefits ahead of the common good can effectively influence individuals to benefit the common good (Mulder, 2016). However, punishments are more likely to lead to reactance (Mulder, 2016; Wit & Wilke, 1990), while rewards are more likely to increase positivity and openness (Mulder, 2016; Tjosvold, 1995).

Finally, the perceived threats or costs related to privacy in disclosing personal data to a disease spread app can differ between nations, depending on how their government or a business controls the apps. The first potential threat is that those infected or potentially infected can be identified on their location data, and thus, experience social stigma (Raskar et al., 2020). This may in turn influence people to feel that their movements are limited. The second potential issue is peoples' perceived level of distance from, or perceived level of trust to, the government or firm. For COVID-19 disease spread apps, it is most often the nations' governments that run the apps. If citizens have higher levels of trust in their government or feel that the government is not too distant from them, that may limit distrust or reactance towards a disease spread app (William et al., 2020). For instance, in some places, people may be forced into quarantine (Swart, 2020; International Monetary Fund, 2020) or be forced to take a test (Lippert-Rasmussen, 2020) although they may not want to, which could reduce the level of trust. This paragraph emphasizes the importance of the methodology to control for the variables trust in government or the credibility of the message sender.

#### 4.0 Persuasive Messaging to Disclosure

To develop the hypotheses related to the prediction that a persuasive message on common good benefits – of disclosing personal data to a disease spread app – leads to a stronger behavioural intention to disclose in relation to the reactance process, it is first important to attempt to understand why this is likely. There are arguments for both why a personal benefits message or a common good benefits message could lead to a stronger intention in the reactance process. Therefore, it is crucial to next examine arguments from both sides.

Studies convey that many Norwegians and Americans express that they are willing to disclose health information for the common good (Vinsrygg, 2019; Mello et al., 2018). In a Norwegian study, 95 % of subjects conveyed they are positive about sharing their health data for the common good or scientific research, but many would like their privacy protected (Vinsrygg, 2019). Parallels can be drawn to an American study of medical trial subjects, where 93 % were willing to disclose data to university scientists, and 83 % were willing to disclose to scientists at profit firms (Mello et al., 2018). Furthermore, less than one-third of 610 respondents were “very” or “somewhat” concerned about the data-sharing risk. Hence, many wish to contribute to the common good with their personal health data, but if their freedom – defined as privacy – is threatened, they may be less inclined to disclose.

Considering that many express their willingness to disclose for the common good, and multiple COVID-19 spread apps have failed, for instance, due to not enough people downloading and using them (FRANCE 24, 2020; Bergstrøm, 2020; Dennis et al., 2020; DW, 2020). There is a discrepancy between behaviour and what people say. Privacy concerns could impede for the COVID-19 apps succeeding, which is discussed in detail in this section 4.0. Thus, whether behavioural intention in relation to the reactance process is stronger or weaker after people are presented a persuasive message focused on benefits for the common good versus for individuals is yet unknown, but it can perhaps be understood.

The findings from research imply most support to that there is a stronger behavioural intention to disclose when persuasive messaging is directed towards the common good benefits. This can be understood from how personal benefits versus benefits for the common good would influence disclosure to a disease spread

app. At first, the focus is on the arguments for why personal benefits are more important for many.

A trait all humans share is that they trade off gains and losses, and the Nobel Prize-winning loss aversion theory conveys that people tend to avoid losses, although there are equal gains (Tversky & Kahneman, 1991). Therefore, people generally worry more about themselves than society, and a perceived loss of privacy can prevent individuals from data disclosure. Additionally, Miron & Brehm (2006) suggested that reactance may differ between people from collectivistic and individualistic cultures. In individualistic cultures, in which this study is performed, people are expected to worry more about themselves. Furthermore, Jonas et al. (2009) found that individuals from more individualistic cultures feel more threatened to personal freedom, relative to collectivists who feel more threatened to collective freedom. Based on the arguments in this paragraph alone, people appear more concerned with personal benefits, but more factors must come into play.

More support to loss aversion theory is research on privacy issues that convey that sensitive health topics can influence people to avoid healthcare (Rindfleisch, 1997; Bansal & Gefen, 2010). Thus, the perceived sensitivity of the data that a disease spread app asks for could affect perceived costs and threat to freedom, and whether an individual discloses. However, findings that can be against that loss aversion are influential in this study's context is related to the privacy paradox. The privacy paradox literature examines the discrepancy between peoples' tendency to express privacy concerns while doing little to protect their personal data (Kokolakis, 2017). For instance, research on the privacy paradox and the privacy calculus found that consumers exchange sensitive information for benefits (Pentina et al., 2016; Zanella & Hallam, 2017). The privacy calculus literature argues that an individual weighs the benefits and risks of disclosing personal data or not before they decide to disclose (Kehr et al., 2015; Majumdar & Bose, 2016).

There are other suggestions from the literature about in which contexts individuals are more likely to disclose information at the personal cost of privacy. For instance, people are more likely to disclose if disclosure leads to immediate personal benefit (Acquisti et al., 2013), and people are more likely to disclose if they believe that disclosure will not harm them in the future (Angst, 2010; Derlega, 1993). Therefore,



people may disclose their data to disease spread apps at the cost of privacy if they perceive a personal benefit. Furthermore, if the message shown to people conveys that privacy will be maintained, that could decrease perceived cost and threat to freedom. Privacy can be maintained through anonymization or a guarantee that the information they share with the app will be kept safe (Direktoratet for e-helse, 2019), which is how privacy will be maintained in this study's experiment, and it will be shown to participants to minimize privacy costs and the threat to freedom. The discussion so far supports that a personal benefits message is most influential, though, more factors must be examined in terms of the common good benefits message's possible effect on disclosure.

As earlier mentioned, many express interest in sharing health data for the common good, but multiple of the disease spread apps for COVID-19 has somewhat failed due to people not contributing enough to the apps. There are various possible explanations for that many express this interest, such as a social bias may have occurred or people may perceive persuasive messages for COVID-19 apps to focus on loss and thus increase reactance (Xu, 2019), but there is not enough evidence to conclude these as explanations. As privacy is a widely studied impediment to data disclosure (Wang et al., 2016), it is as aforementioned assumed to be an explanation and contributing factor to why people are not disclosing in the context of this study. Additionally, Fox et al. (2021) point out that individuals' acceptance of government surveillance technology and privacy's impact on its acceptance is nascent.

Another explanation for the discrepancy between what people say and do could be that consumers may make decisions on intuition and emotions rather than rationale (Kangas, 1997). As that rational decision-making can be perceived as more costly than intuitive decision-making (Sahm & Weizsäcker, 2015). Hence, people may not perceive the rational benefits of disclosure to a disease spread app. Parallels for this can be made on an American study on why many avoid medical care, although respondents could end or deal with physical or mental distress (Taber et al., 2015). Results conveyed that 33.3 % of 1,369 subjects assessed seeking medical care unfavourable, and 12.2 % perceived a low need to seek medical care (Taber et al., 2015).

The most frequent reason for unfavourable assessments was related to the physicians, for example, interpersonal concerns and quality of medical care (Taber et al., 2015). Other unfavourable assessments were of medical systems, such as seeking medical advice is perceived as a hassle; the potential negative outcomes, for example, dislike of health professionals' medical advice; and emotions prevent them from seeking medical care, such as shame due to the illness preventing them from seeking care (Taber et al., 2015). Regarding a perceived low need to seek medical care, the most frequent reason was that subjects thought they would become well over time. Of these reasons, parallels can be drawn to that consumers may unfavourably assess disease spread apps in terms of efficiency of performing medical care, or they may perceive using the app as a hassle (O'Brien, 2020), or they may think that the app collects data they find sensitive and do not want others to know, due to negative emotions or cognitions associated with the data. In addition, they may not consider the app effective in fighting a pandemic such as COVID-19.

Continuing with why the common good benefits message is expected to lead to a larger behavioural intention. There is a myriad of evidence that altruism is an explanation to people contributing to the common good (Bartsch & Kloß, 2018; Guttman et al., 2016), such as by being a blood donor, but some can care more about self-interest than others (Ricard, 2015; Ruger, 2015). As Darwin (1871) said, "social instincts lead an animal to take pleasure in the society of its fellows, to feel certain amount of sympathy with them, and to perform various services for them". In addition, as earlier mentioned, based on the few studies about the influence of messages focused on benefits for the common good on threat to freedom, reactance, and intention, a persuasive message should focus on: gains and rewards, nudges, tips, strategies, privacy, or evidence to encourage behaviour that supports the common good.

Thus, if a disease spread app conveys to an end-user the benefits and rewards of sharing data for the common good, evidence that encourages disclosure, tips or strategies on how to use a disease spread app, and that privacy is maintained. The perception of potential costs is minimized. Altruistic motivations are then expected to influence individuals to disclose. Furthermore, people can as well perceive the personal benefit of contributing to dealing with the pandemic, and Tang et al. (2015)

convey that message content focused on benefits for the public good increases an individual’s intention to approach rather than avoid a message.

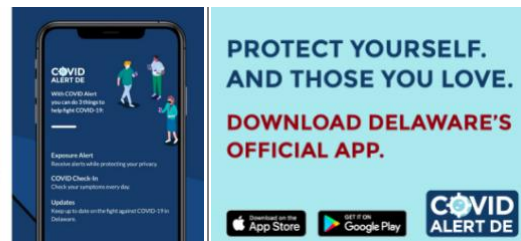
To further support the prediction about the common good benefits message leading to a stronger behavioural intention to disclose, relative to personal benefits. Analyses were performed on prior promotional messages for COVID-19 apps used around Europe and North America. However, there can be elements not mentioned that as well contributes to the successes and failures of the apps. Firstly, in the United States, the states with the highest app adoption rate per November 2020 were Virginia, with the app *COVIDWISE*, and Delaware’s, which’s app is *COVID Alert De*, where Virginia has the highest rate (Garza, 2020). Officials in Virginia attributed the success to high spending on promotions, and disease spread apps with low success did receive little spending on promotion (Garza, 2020). Based on the messages below and belonging product descriptions for the apps at Apple Store (n.d.-a, -b), Virginia’s messages focus more on the common good, while the messages for Delaware’s app focus more on personal benefit. This implies that the prediction is correct as Virginia has a higher adoption.



For Delaware  
(McAneny, 2020)



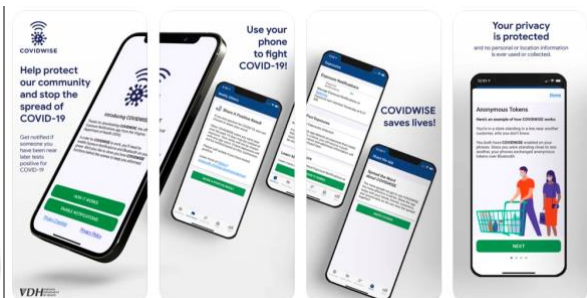
For Delaware  
(Ciolino, 2020; Apple Store, n.d.-a)



For Delaware  
(Delware.gov., 2020)

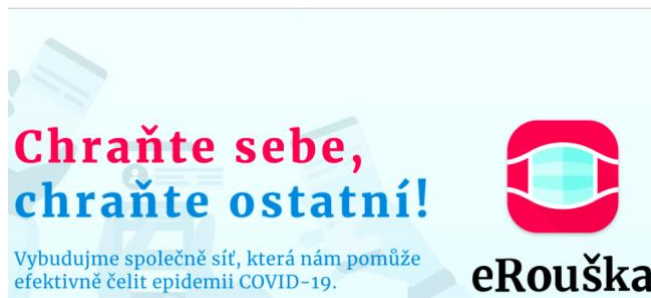


For Virginia.  
(Roanoke Government, 2020)



For Virginia.  
(Apple Store, n.d.-b)

Secondly, Denmark is among the nations where a COVID-19 disease spread app, which is called *Smitte / stop*, has been the most popular and successful (AFP, 2020). Additionally, in the Czech Republic the COVID-19 app, *eRouska*, has had as much as 1,000,000 downloads by mid-October in 2020 (Kenety, 2020), among their circa 10,000,000 citizens (Worldometer, 2020). As one can see in the images below and in these apps' product descriptions in Apple Store (n.d.-c, -d), promotional messages primarily focus on the personal and the common good benefits of using the app. Hence, a focus on both benefit types may bring synergies, but the Czech Republic focuses somewhat more on the common good. This implies as well that the prediction is confirmed.



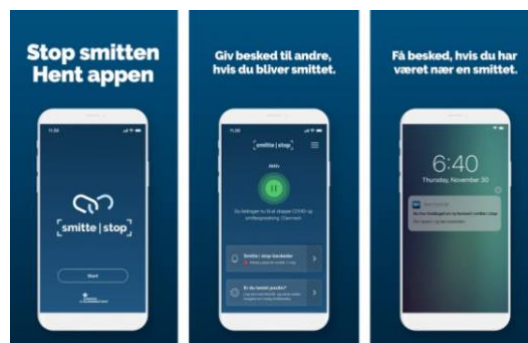
In the Czech Republic.

Protect yourself, protect others! Let us build a network together to help us deal effectively with the COVID-19 pandemic (eRouska, 2020).



In the Czech Republic.

On the first page of eRouska, they convey that oneself and others in close proximity can be protected through the use of the app (Apple, n.d.-d, 2020)



In Denmark. Translations (Macaraig, 2020):

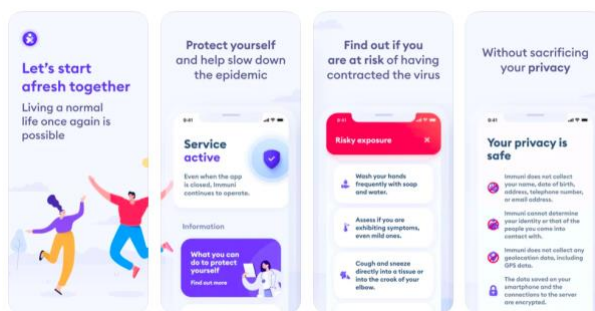
Left picture: *Stop the spread. Get the App.*

Middle picture: *Give a message to others if you are infected.*

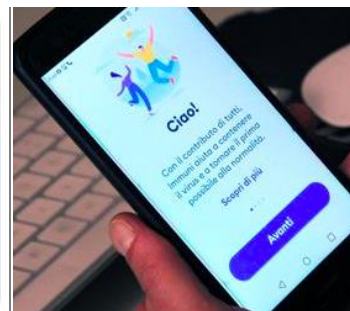
Right picture: *Receive a message if you have been close to somebody infected*

Thirdly, in Latin Europe, specifically in Italy, their COVID-19 app called *Immuni* is somewhat popular (AFP, 2020). While in Spain, the government has stated that their COVID-19 app named *Radar COVID* has not been satisfactory in terms of popularity (AFP, 2020). Although, Spain’s government has urged people to download it to reduce the spread highly (AFP, 2020).

In one of Immuni’s promotional messages from a news article in the image below to the left, they convey, “With everyone’s contribution, Immuni helps contain the virus and return to normal as soon as possible.” In one of Radar COVID’s promotional messages as a poster, which is in the bottom image below, they state, “Protect yourself and others / Know at all times if you are exposed to the coronavirus / Anonymously report your positive COVID diagnosis / Anonymously communicate the exposure with a positive contact ... Thanks for taking care of you and taking care of others.” From examining Radar COVID’s app description in Apple Store (n.d.-e), and from examining the app in the registration process, they barely communicate the app’s benefit. In contrast, the app description for Immuni in Apple Store (n.d.-f) is more focused on various benefits, which are both for the common good and on an individual level. Based on the evidence in this paragraph, Radar COVID focuses somewhat more on personal benefits and has a lower adoption rate, while Immuni, which is more successful, focuses on both the common good and personal benefits approximately equally much. This somewhat implies that the prediction is correct.



In Italy.  
(Apple Store, n.d.-f)



In Italy.  
(Adnkronos, 2020)



In Spain.

(Click for the sun, 2020)

In all the mentioned countries and in their app descriptions at Apple store (n.d. -a, -b, -c, -d, -e, -f), it is communicated that privacy is well maintained, as that users' information is not identifiable, except for the COVID Alert DE. COVID Alert DE solely communicates that data will not be publicly identifiable, and the data will not be used for any other reasons than alerting that one has been close to somebody infected (Apple, n.d.-a). Hence, privacy concerns should be already solved for most of the mentioned nations, but privacy concerns are expressed in the nations and other European nations as well (Masters & Mercury, 2020; Perrigo, 2020; Kenety, 2020; Scarpetti et al., 2020). Except, information was not found on privacy concerns in Italy and Denmark. For Italy, it could be related to that the government has set and is developing laws to guarantee anonymity through the apps, and privacy has been widely discussed in the nation (Figueroa, 2020). For Denmark, it could be connected to that they have already had a debate and worked on solving privacy concerns that could be associated with the app (Jørgensen, 2020). Furthermore, Norway's app was scrapped due to privacy issues (Kalveland, 2020), and the firm that made Denmark's app made a new one for Norway (Veberg, 2021). Though, as there are people across Europe who yet experience privacy concerns, they likely feel that their freedom is threatened, which confirms that threat to freedom in the context of this study can be considered as privacy. In total, there is more and stronger evidence for that those presented with the common good benefits message have a larger behavioural intention to disclose personal data to a disease spread app.

To next predict how the reactance process would look like when driving behavioural intention to disclose personal data to a disease spread app, a wide search was made. In terms of magnitudes of paths between variables in the proposed reactance process, a literature review on reactance by Steindl et al. (2015) is relevant. It conveys that much empirical support is on that threat to freedom

increases reactance, and next reactance decreases attitude towards the behaviour promoted in the message. The attitudinal intention then increases intention to behave according to the persuasive message. In this proposed reactance process, trait proneness was mostly found as a significant antecedent to reactance (Amarnath & Jaidev, 2020; Shen & Dillard, 2005b; Lowry et al., 2010; Lowry & Moody, 2015; Boukamcha, 2016; Hopp, 2015; Petegem et al., 2015; Weiler, 2020). Additionally, trait proneness was mostly found to increase reactance (Lowry & Moody, 2015; Boukamcha, 2016).

Regarding the directions of the magnitudes for the paths between variables in the proposed reactance process when beginning from threat to freedom, it can be understood by examining prior studies seeking similar results. From communication research, it was found that threat to freedom has a positive direction on reactance – when reactance is anger and negative cognition – (Quick et al., 2011; Shen & Dillard, 2005b), and reactance has a negative direction on attitudinal intention (Richards & Larsen, 2016; Shen & Dillard, 2005b; Reynolds-Tylus, 2019b). Attitudinal intention lastly has a positive direction on behavioural intention (Richards & Larsen, 2016; Shen & Dillard, 2005b; Reynolds-Tylus, 2019b).

After a broad search, no research has been found on what direction and magnitude threat to freedom of privacy has on reactance – as anger and negative cognition – when people have been presented a persuasive message related to personal or common good benefits of disclosing personal data to a disease spread app. This was not found for the other paths in the proposed reactance process. Moreover, there is no available research on whether the reactance process leads to a stronger behavioural intention for those presented with the common good or personal benefits message. However, the proposed chain-of-effects' and reactance process' directions and magnitudes are found in similar contexts for reactance and persuasive messaging. Additionally, evidence implies that intention should be larger for those presented the common good benefits message. Due to this literature gap and prior reasoning, the following is predicted:

**H1:** Once a persuasive message on common good or personal benefits of disclosing personal data to a disease spread app is presented, threat to freedom of privacy

positively influences and thus increases reactance, which consists of anger and associated negative cognition.

**H2:** Continuing from H1, reactance negatively influences and thus decreases attitudinal intention to disclose personal data to a disease spread app.

**H3:** Following H2, attitudinal intention positively influences and thus increases behavioural intention to disclose personal data to a disease spread app, leading to a stronger behavioural intention when the common good benefits message is presented.

In terms of the directions of the magnitudes for the paths in the proposed reactance process when it begins from trait proneness, there is mostly evidence that trait proneness has a positive direction on reactance (Lowry & Moody, 2015; Boukamcha, 2016). Next reactance has a negative influence on attitudinal intention (Weiler, 2020; Shen & Dillard, 2005b). Thereafter, attitudinal intention has a negative or positive effect on behavioural intention (Weiler, 2020; Petegem et al., 2015; Shen & Dillard, 2005b).

No studies are available on the directions and magnitudes of the paths between variables in the proposed reactance process, when the process begins from trait proneness, and when people have been presented a persuasive message related to personal or common good benefits of disclosing personal data to a disease spread app. Furthermore, no research is found on whether the reactance process leads to a stronger behavioural intention for those presented with the common good benefits message or the personal benefits message. Though, the chain-of-effects' and reactance process' directions and magnitudes are similar to other studies on reactance and persuasive messaging, and thus can be used for prediction. In addition, evidence suggests that behavioural intention should be larger for those presented the common good benefits message. With this literature gap and prior reasoning, the following is predicted:

**H4:** Once a persuasive message on common good or personal benefits of disclosing personal data to a disease spread app is presented, trait proneness positively influences and thus increases reactance, as anger and associated negative cognition.



**H5:** Subsequently to H4, reactance negatively influences and thus decreases attitudinal intention to disclose personal data to a disease spread app.

**H6:** Continuing from H5, attitudinal intention either positively influences and thus increases, or negatively influences and thus decreases, behavioural intention to disclose personal data to a disease spread app, leading to a stronger behavioural intention when the common good benefits message is presented.

#### **4.1 The Reactance Process Beginning from Threat to Freedom**

This article proposes that behavioural intention to disclose personal data to a disease spread app is larger for those presented the persuasive message on common good benefits, relative to personal benefits, of disclosing personal data to a disease spread app. In addition, prediction is that the proposed reactance process driving behavioural intention begins at the variable threat to freedom. Threat to freedom is expected to positively influence and increase reactance. Next reactance is expected to influence negatively and decrease an individual's attitudinal intention towards disclosing data to a disease spread app. Finally, attitudinal intention is expected to influence positively and increase the behavioural intention to disclose. However, the magnitudes of the paths between variables in the proposed reactance process are expected to differ between those presented with the personal or common good benefits message. Why there are these differences and how these differences look like are examined in detail next, but the variable trait proneness is not as it is examined in the next subsection, subsection 4.2.

A literature review on reactance by Steindl et al. (2015) conveys that the higher level of perceived threat to freedom somebody experiences due to a message, the more reactance increases, and it leads to a more negative attitude towards the behaviour promoted in the message. The magnitude of reactance depends on the perceived size of the threat and the perceived significance of the threatened freedom (Steindl et al., 2015). For instance, an individual could deny the existence of a threat (Shen & Dillard, 2005b), similarly to the privacy paradox. Moreover, persuasion literature conveys that the importance of a perceived threat of freedom, due to a persuasive message, lies in that it can encourage an individual to do the opposite of what the message promotes, or it can prevent an individual from engaging in the

behaviour or adopting an attitude in the message (Fransen et al., 2015). Additionally, a high freedom threatening message can create the opposite effect (Steindl et al., 2015). Therefore, threatening language is avoided in the message design in the methodology.

However, previous studies support that messages can reduce threat to freedom, which then reduces reactance, and thereafter increases attitudinal intention and behavioural intentions related to what is promoted in the message (Steindl et al., 2015). Based on the findings from the literature so far mentioned in this subsection 4.1, and as behavioural intention is expected to be larger for those presented the common good benefits message. The predicted paths in the proposed reactance process should differ in magnitudes between those presented with the common good benefits message, and those presented with the personal benefits message. Considering that those presented with the personal benefits message are predicted to have a lower behavioural intention, the path between threat to freedom of privacy and reactance, and the path from reactance to attitudinal intention, should be larger for them. Though, the path from attitudinal intention to behavioural intention should be smaller for them. In other words, the path from threat to freedom to reactance, and the path from reactance to attitudinal intention, are predicted to be smaller for those presented with the common good benefits message. While the path from attitudinal intention to behavioural intention is larger for those presented the common good benefits message.

After a broad search, no studies are found on precisely the direction of and difference in magnitude of the path from threat to freedom of privacy to reactance, between individuals who have been presented a persuasive message on common good or personal benefits of disclosing personal data to a disease spread app. Furthermore, this was nor found for the path between reactance and attitudinal intention, or the path between attitudinal intention and behavioural intention. With previous reasoning and this literature gap, the following is predicted:

**H7:** Threat to freedom of privacy influences reactance – as anger and negative cognition – positively and is larger when the persuasive message focuses on personal benefits, relative to the common good benefits, of disclosing personal data to a disease spread app.

**H8:** Proceeding from H7, reactance influences attitudinal intention – to disclose personal data to a disease spread app – negatively and larger when the persuasive message is about the personal benefits, relative to the common good benefits.

**H9:** Continuing from H8, attitudinal intention influences behavioural intention – to disclose personal data to a disease spread app – positively and is larger when the persuasive message focuses on the common good benefits, relative to the personal benefits.

#### **4.2 Trait Proneness Moderating Reactance in the Reactance Process**

This article suggests, as mentioned, that behavioural intention – to disclose personal data to a disease spread app – is larger for those presented the persuasive message about the common good benefits of disclosing personal data to a disease spread app, relative to personal benefits. Additionally, it is predicted that trait proneness precedes reactance to increase it and affect it positively in the proposed reactance process. Next, reactance is predicted to influence negatively and decrease an individual's attitudinal intention to disclose personal data to a disease spread app. Thereafter, attitudinal intention is predicted to influence positively and increase, or influence negatively and decrease, the behavioural intention to disclose personal data to a disease spread app. Though, the magnitudes of the paths between variables in the proposed reactance process should differ between those presented with the personal benefits or common good benefits message. Why these differences exist and how these differences look like are carefully examined next. The threat to freedom variable is not examined, as it was examined in subsection 4.1.

In 1981, Brehm & Brehm stated that individuals might vary in their proneness level for experiencing reactance due to a stimulus. This is called *trait proneness* (Shen & Dillard, 2005a) as earlier explained. Trait proneness is as well known as trait reactance or reactance proneness (Amarnath & Jaidev, 2020). After Brehm & Brehm's statement in 1981, various scholars developed scales for measuring transituational propensity to reactance arousal (Shen & Dillard, 2005b). Compared to individuals that score low on proneness to reactance, individuals with high proneness to reactance often have a stronger need to maintain independence, and they are often more resistant to persuasive messages (Quick et al., 2011; Boukamcha, 2016).

The level of trait proneness depends on the perceived threat to freedom due to the message, this can in turn influence the level of reactance and thus attitudinal and behavioural intention towards an advocated behaviour of a message (Trump, 2016; Reynolds-Tylus, 2019a; Shen & Dillard, 2005b). Besides, like for threat to freedom, if a message is highly threatening to free behaviour or highly threatening by being controlling, then trait proneness can increase more than if the language is non-freedom threatening (Steindl et al., 2015). Due to this, this study aims to have a message that scores low on freedom-threatening language in the methodology. Furthermore, as mentioned, previous findings support that messages can reduce threat to freedom, which then reduces reactance, and thereafter increases attitudinal and behavioural intentions related to the behaviour promoted in the message, or a message can lead to a vice versa process (Steindl et al., 2015). As mentioned, these various findings from the literature conveys that the higher threat to freedom of privacy, the higher reactance and trait proneness should be, and the lower the attitudinal and behavioural intention is.

As it is predicted that behavioural intention should be larger for those presented the common good benefits message, the path between trait proneness and reactance, and the path between reactance and attitudinal intention, should be larger for those presented the personal benefits message, relative to the common good benefits message. While the path between attitudinal intention and behavioural intention should be larger for those presented the common good benefits message, relative to the personal benefits message, if the path has a positive direction. If the path has a negative direction, then the path should be smaller for those presented with the common good benefits message.

No research is found on specifically the direction of, or difference in magnitude of the path from trait proneness to reactance, between individuals have been presented a persuasive message on common good benefits or personal benefits of disclosing personal data to a disease spread app. Moreover, this was nor found for the path between reactance and attitudinal intention, nor the path between attitudinal and behavioural intention. Based on prior reasoning and this literature gap, it is predicted:

**H10:** Trait proneness influences reactance – as anger and negative cognition – positively and is larger when the persuasive message focuses on the personal benefits, compared to the common good benefits, of disclosing personal data to a disease spread app.

**H11:** Progressing from H10, reactance influences attitudinal intention – to disclose personal data to a disease spread app – negatively and is larger when the persuasive message is about the personal benefits, relative to the common good benefits.

**H12:** Continuing from H11, attitudinal intention influences behavioural intention – to disclose personal data to a disease spread app –, either positively or negatively, and is larger for the persuasive message focused on common good benefits if the path's direction is positive, but smaller if negative, relative to the personal benefits message.

### 4.3 Emotional Drivers of Reactance to Disclose

As aforementioned, this study builds on that reactance in the suggested reactance process is a mediator between threat to freedom of privacy and attitudinal intention. Moreover, reactance is treated as a second order construct with the latent variables *anger* and its associated *negative cognition*, which is evoked by the persuasive messages. The study as well tests whether *fear* moderates the path between reactance and trait proneness or threat to freedom of privacy in the proposed reactance process.

After Shen and Dillard (2005b) stated that reactance is a second order construct generated from anger and negative cognition, known as the intertwined model, many studies have confirmed that they were correct (Quick et al., 2011; Richards & Larsen, 2016; Shen, 2014; Rains, 2013; Rosenberg & Siegel, 2018). Prior studies found that anger and negative cognition as reactance negatively affects persuasion (Quick & Stephenson, 2007; Richards & Banas, 2015). Higher levels of reactance decrease attitudinal intention and thus the behavioural intention (Shen & Dillard, 2005b; Steindl et al., 2015; Quick & Stephenson, 2007; Shen, 2014; Quick, 2012). Besides, previous studies on persuasive health messages confirm that people have an emotional and cognitive response to health messages, influencing their acceptance of the message (Richards & Banas, 2015). For these reasons, anger and associated negative cognition is an appropriate measure for reactance in this study.

Reviews of the reactance literature propose future research to explore other emotions in relation to reactance (Amarnath & Jaidev, 2020), such as fear (Rosenberg & Siegel, 2018). Fear is another potentially relevant emotion to this study because privacy concerns can evoke fear (Gu et al., 2017; Degirmenci, 2020), and privacy is considered the threat to freedom in the proposed reactance process. For example, disease spread apps identify the location trails of infected individuals, and infected individuals can fear being identified through their location trails (Raskar et al., 2020). Hence, their fear of social stigma or fear of their privacy being jeopardized can prevent them from disclosing that they are infected (Raskar et al., 2020). Furthermore, healthy individuals may fear to face the same faith if they accidentally are near somebody infected.

Generally, can fear-induced persuasive messages increase reactance (Shen & Coles, 2015) and have a negative effect on persuasion (Shen, 2011), but this study focuses on fear as a side-effect of messages rather than the messages appealing to fear. Fear due to privacy concerns is thus expected to increase, but fear is predicted to be lowered by the potential of losing benefits for the common good or oneself in terms of, for instance, not obtaining control of the spread of COVID-19. Of these reasons, it is expected that fear positively influences and increases the path between reactance and trait proneness or threat to freedom of privacy in the context of this study, and fear should thus decrease the level of positive attitudinal and behavioural intention to disclose personal data to the disease spread app.

There is no available research on the intertwined model regarding the direction and magnitude it has on attitudinal intention in the specifically proposed reactance process. There is neither available research on the magnitude and direction of fear as a moderator of the path between reactance and threat to freedom of privacy, or trait proneness, in the reactance process. Though, the prior reasoning can be utilized to make predictions on this discovered gap in the literature. Thus, the hypotheses are:

**H13:** Reactance is a second order construct of the latent variables anger and associated negative cognition that mediates the proposed reactance process, and that

negatively affects and decreases attitudinal intention, and thus indirectly decreases behavioural intent.

**H14:** Fear positively moderates, and thus increases, the path between reactance and threat to freedom of privacy or trait proneness in the proposed reactance process, which therefore indirectly decreases attitudinal intention and behavioural intention.

## 5.0 The Conceptual Framework

Figure 2 further below presents the overall conceptual framework, which organizes the mentioned predictions on chain-of-effects and the proposed reactance process. The framework aims to explain the reactance process from an individual being presented with the personal or common good benefits message, to the individual's intention to disclose personal data to a disease spread app. No prior research has studied or explained this process. The conceptual framework can explain the success or failure of specific disease spread apps, which can benefit individuals and societies. Next, the organization behind the conceptual framework is explained.

Firstly, communication research widely agrees that *threat to freedom* is a part of the reactance process, and that threat to freedom can be considered either as an antecedent to reactance, reactance itself, or a combination with other reactance components, such as anger (Ratcliff, 2019). However, the intertwined model (Shen & Dillard, 2005b), as well known as state reactance (Amarnath & Jaidev, 2020), has received the most empirical support according to meta-analyses and literature reviews (Rains, 2013; Rosenberg & Siegel, 2018; Ratcliff, 2019). The intertwined model is as mentioned *reactance* as a latent variable with the items *anger* and its' associated *negative cognition* (Shen & Dillard, 2005b). Meaning that threat to freedom should not be reactance itself, nor a combination with other reactance components.

Leaving us with threat to freedom as an antecedent to reactance, and reactance as anger and associated negative cognition. Literature reviews suggest future research to investigate other emotions in relation to reactance (Amarnath & Jaidev, 2020), such as fear (Rosenberg & Siegel, 2018), and fear appears as earlier mentioned relevant for this study. Thus, fear is tested as a moderator of the path between reactance and trait proneness or threat to freedom.

Next, Amarnath & Jaidev (2020) suggests trait proneness, in relation to state reactance, to be further examined in future marketing research. After a wide search in the literature, trait proneness was mostly found as a significant antecedent to psychological reactance and state reactance (Lowry et al., 2010; Lowry & Moody, 2015; Boukamcha, 2016; Hopp, 2015; Petegem et al., 2015; Weiler, 2020; Amarnath & Jaidev, 2020; Shen & Dillard, 2005b). Therefore, *trait proneness* is an antecedent to reactance in this study.

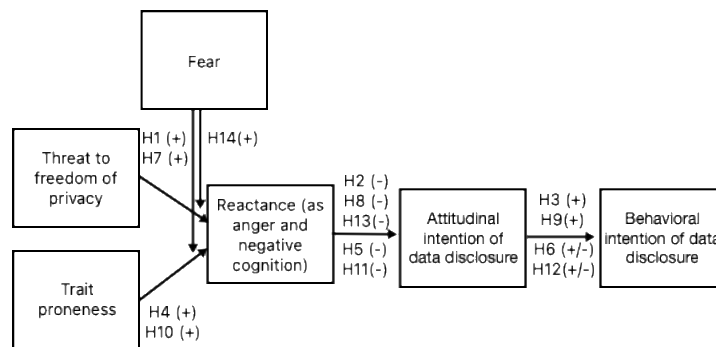
Next, the mediator reactance has an outcome (Amarnath & Jaidev, 2020; Ratcliff, 2019). The relevant outcome for this study is the *attitudinal intention* and *behavioural intention* concerning what the persuasive message advocates. The attitudinal intention may precede and lead to behavioural intention, or attitudinal intention and behavioural intention can diverge in separate directions as a consequence of reactance (Amarnath & Jaidev, 2020; Shen & Dillard, 2005b). In Amarnath & Jaidev's (2020) literature review, they classified external responses of consumer reactance based on the literature. The most relevant classification was behavioural intention as a significant consequence of an attitude towards a stimulus and reactance, which was based on a study by Quick (2013). Moreover, a review article by Steindl et al. (2015) states that, in the context of persuasion, reactance as anger and negative cognition influencing an individual's attitudinal intention (Shen & Dillard, 2005b; Kim et al., 2013; Rains, 2013) appears to be crucial in the reactance process. Furthermore, a wide search indicated that most reactance and communication studies use attitudinal intention as an antecedent to behavioural intention. For these reasons, reactance is expected to lead to attitudinal intention, and attitudinal intention next leads to behavioural intention.

Finally, based on an extensive search, persuasive messages were usually not a moderator anywhere in the reactance process, but all the paths in the reactance process, in terms of their directions and magnitudes, could differ between persuasive messages. When presenting people with a persuasive message on personal or common good benefits of disclosing personal data to a disease spread app, it is expected that threat to freedom of privacy and trait proneness increases reactance. Reactance is then expected to reduce the attitudinal intention to disclose to a disease spread app, where attitudinal intention then increases or decreases



behavioural intention to disclose. The path from threat to freedom or trait proneness to reactance, and from reactance to attitudinal intention, is expected to be larger when the persuasive message focuses on personal benefits, relative to the common good benefits. While the path from attitudinal intention to behavioural intention is expected to be smaller for those presented the personal benefits message, as long as the path has a positive direction. If the path has a negative direction, then the path should be larger for those presented the personal benefits message, relative to the common good benefits message.

In sum, it is predicted that trait proneness and threat to freedom have a main effect on reactance. Where reactance next has a main effect on attitudinal intention towards disclosing personal data to a disease spread app, and then attitudinal intention has a main effect on behavioural intention to disclose. These chain-of-effects, these hypotheses, and the paths' expected directions, are illustrated in the conceptual framework in Figure 2 below.



**Figure 2** Conceptual framework of the proposed reactance process.

### 6.0 Method

One experiment with two conditions was conducted. In each condition, respondents read one of two persuasive messages. The conditions differed solely in message topic: common good benefits or personal benefits. More precisely, one message promoted disclosure of personal data to a disease app based on benefits for the common good, while the other one promoted disclosure based on personal benefits. Furthermore, the paths between variables in the proposed conceptual framework were measured after subjects read one of the persuasive message scenarios. The scenarios convey what a disease spread is and does. In addition, the scenarios are about privacy policies in terms of why data is collected and how privacy is

maintained. The personal benefits scenario is in Appendix 2 and in Figure 4 on page 32, and the scenario for the common good benefits message is in Appendix 1 and in Figure 3 on page 31.

### **6.1 Participants**

A pre-test of the manipulation was performed prior to the data collection for the final experiment. For both the pre-test and final experiment, pilot studies were run to validate and improve the validity of the persuasive messages, instructions, and other content. With the pilots, changes were made to the wording and on what content was included. The aim was to make the experiment quick to read and fill out, to motivate respondents to finish it. With a convenience sampling method, the pre-test of the manipulation was run in March 2021, and the final experiment was conducted in April 2021. The pre-test of the manipulation, the final experiment, and the pilot studies were web-based using Qualtrics. All three were distributed through the author's network through Facebook Messenger, e-mails, in person, calls, and text messages. Additionally, all three were distributed through the author's network's connections, and through forums. In total 303 responses were collected. After data was collected, it was cleaned by removing invalid answers, such as removing incomplete responses or removing scale responses of solely ones. In the end, there were 296 participants, being 148 respondents for the common good benefits message, and 148 for the personal benefits message.

Analyses on the final experiment's data were performed separately on those who had or had not downloaded the COVID-19 app, for comparisons and to avoid possible self-selection bias. Additionally, each analysis on either those with or without the app distinguished between those presented with the common good or personal benefits message. Meaning four groups were analysed to answer the hypotheses. For the participants presented with the personal benefits message, one group was made of those without the COVID-19 app, and one group was made of those with the app. The same was done for participants presented with the common good benefits message. A one-way independent analysis of variance presented in subsection 7.1 conveys that if the independent variable is whether participants have the COVID-19 app or not, there is a difference in the dependent variable behavioural intention among the participants presented with the personal benefits message, or the participants presented with the common good benefits message.

Thus, there could be a self-selection bias, and it was necessary to analyse four groups.

The general characteristics of each group in terms of means are in Table 1. Most respondents were Norwegian out of convenience, but a few had another country of origin or nationality being Danish, Chinese, Swedish, Canadian, Indian, Filipino, Irish, Colombian, Moroccan, British, and Russian. Thus, collectivistic cultures were minimally represented in this study relative to individualistic cultures.

**Table 1** General characteristics in terms of means for the study population by group.

Characteristics	CG (W.A.) (n=72)	PB (W.A.) (n=68)	CG (WO.A.) (n=76)	PB (WO.A.) (n=80)
Mean				
Female	.57	.71	.58	.55
Male	.43	.30	.42	.45
Age	35.93	31.17	39.74	34.00
High School	.05	.06	.00	.10
Bachelor's	.15	.35	.25	.70
Master's	.75	.59	.75	.05
Doctorate	.05	.00	.00	.05
Other	.00	.00	.00	.10
Origin Norwegian	.86	.97	.85	.84
Origin other	.14	.03	.15	.16
Nationality Norwegian	.92	.99	.92	.85
Nationality Other	.08	.02	.08	.15

CG: common good benefits; PB: personal benefits; W.A: with COVID-19 app; WO.A.: without COVID-19 app.

## 6.2 Message Design

Both messages were the same, except that one focused on benefits for the common good, while the other focused on benefitting people personally. Hence, the messages were mostly formatted and presented in the same way across the conditions. To strengthen the manipulation, the personal benefits message had the phrase "Download the COVID-19 disease spread app to protect yourself!" at the top in letters larger than the rest of the text, while the common good benefits had

the same, but focused on the common good benefit “Download the COVID-19 disease spread app to protect others!” Besides, as the study was of disease spread apps, the persuasive messages were formatted as many of the COVID-19 apps are, but the visual elements were kept to a minimum for it not to influence the respondent. Besides, the messages were kept short in terms of time and the number of words to motivate people to respond. The messages are presented on the next page in English. In Appendix 1 are the common good benefits message both in Norwegian and English, and in Appendix 2 are the personal benefits message in Norwegian and English.

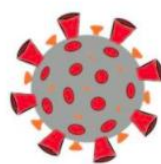
Moreover, the style of the message content was made according to the following relevant findings from the literature. Firstly, the messages’ language had low levels of controlling or freedom threatening language to not increase the reactance level (Steindl et al., 2015; Amarnath & Jaidev, 2020). Additionally, to increase disclosure likelihood, the messages focused on nudges (Bruns et al., 2018) and gains rather than losses of disclosing personal data to a disease spread app (Cho & Sands, 2011). Secondly, evidence was provided in the messages to encourage disclosure (Liang et al., 2018). Thirdly, to further encourage disclosure, the messages concentrated on tips and strategies on how to use a disease spread app (Liang et al., 2018). Fourthly, the messages focused on rewards of disclosure (Mulder, 2016), because rewards are more likely to increase positivity and openness (Mulder, 2016; Tjosvold, 1995) relative to punishment, which is more likely to lead to reactance (Mulder, 2016; Wit & Wilke, 1990). Lastly, the messages conveyed that privacy was maintained to facilitate disclosure (Raskar et al., 2020).

### Download the COVID-19 disease spread app to protect others!

A disease spread app aims to limit a pandemic's spread, such as COVID-19.  
The apps track infected individuals to warn app users of being or having been close to somebody infected.

#### Privacy Policies:

The COVID-19 disease spread app collects information on whom is infected and societies' locations and movements over time. Their information is collected for the following purposes:



- To improve app functionality for societies' benefit.
- To warn societal members whether they have been close to somebody infected or warn others that they are infected.
- Advance research for potentially societies' benefit.

Also, societies' privacy is maintained in the following ways:

- Societies' locations and movements is hidden for other users.
- Societal members are anonymized.
- Societies' shared information is kept safe.
- Use of Bluetooth to collect anonymous information about societies.

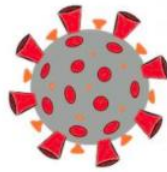
**Figure 3** The persuasive message on common good benefits.

## Download the COVID-19 disease spread app to protect yourself!

A disease spread app aims to limit a pandemic's spread, such as COVID-19. The apps track infected individuals to warn users of being or having been close to an infected.

### Privacy Policies:

The COVID-19 disease spread app collects information on whom is infected and your locations and movements over time. Your information is collected for the following purposes:



- To improve app functionality for your benefit.
- To warn you whether you have been close to somebody infected or warn your close ones that you are infected.
- Advance research for potentially your own benefit.

Also, your privacy is maintained in the following ways:

- Your locations and movements are hidden for other users.
- You are anonymized.
- Your shared information is kept safe.
- Use of Bluetooth to collect anonymous information about you.

**Figure 4** The persuasive message on personal benefits.

### 6.3 Research Design

An experimental design was used for the final experiment. Each participant was randomly allocated either to a persuasive message about personal benefits of disclosing personal data to a disease spread app, or about common good benefits of disclosing personal data to a disease spread app. Before reading one of the persuasive messages, participants were presented a consent form and an introduction to the experiment. The form aimed to motivate people to participate – for instance by pointing out that the average response time was below five minutes –, and to ensure compliance with GDPR, privacy laws, and ethics. Moreover, the persuasive messages could evoke biases, such as social bias, as many could think that using a disease spread app is socially desirable. Therefore, participants were assured of anonymity.

In the first section of the final experiment, after giving consent, participants read one of the persuasive messages. Next, they were presented respectively with the measure for the dependent variable behavioural intention, and then the measures for the independent variables attitudinal intention, negative cognition, threat to freedom, fear, and anger. At the end of the section, participants answered whether they had downloaded the COVID-19 app if it was available to them, because those who had downloaded or not could differ. In other words, as mentioned, there could be a self-selection in downloading the app, which should be controlled for.

In the next section, participants were measured on their trait proneness. In the subsequent section, they were asked for relevant control variables, such as how credible they found the persuasive message they had read. In the last section, they

were asked for relevant demographics. Right after respondents finished, they received a message thanking them for their participation. The survey is in Appendix 3 in Norwegian and in Appendix 4 in English.

The data was analysed by running a simple analysis of variance, to understand whether behavioural intention was larger for those presented the common good benefits message or personal benefits message. Additionally, a PROCESS macro was run to set up the model, and to understand whether the model was as the proposed reactance process and conceptual framework.

## 6.4 Measures

### *Attitudinal Intention*

Respondents' attitudinal intention was measured through seven seven-point semantic differential scales validated and made by Shen & Dillard (2005a), where respondents rated their attitude towards the behavior promoted in the persuasive message. This is a typical way to measure attitudinal intention in reactance studies (Ratcliff, 2019), and the measure by Shen & Dillard (2005a) was the most reoccurring one out of the accessible attitudinal intention measures in relation to reactance. Participants were presented with a phrase tailored to this study, being "Adopting the app above is (please choose a box from 1 to 7 for each bipolar adjective below):" with the word pairs bad/good, unnecessary/necessary, unfavorable/favorable, negative/positive, foolish/wise, undesirable/desirable, and detrimental/beneficial. Alpha reliability became 0.951. A composite score was made for each participant, being an average of all responses on the seven scales for each participant.

### *Behavioral intention*

The behavioral intention was measured by a 100-point, single-item estimate by Shen & Dillard (2005a). The estimate was adjusted to this study to be an approximate of respondents' likelihood to adopt a disease spread app in the near future if it is available to them. Shen & Dillard's (2005a) measure was the most reoccurring one in the accessible reactance literature, and this way of measuring behavioural intention is common in reactance research (Ratcliff, 2019). Participants were presented "How likely are you to adopt the app in the near future if it is available to you? Please choose a % in the slider below. 0% means I would

certainly not download this app, and 100% means I would certainly download this app.”

### *Negative cognition*

To measure negative cognition, a thought listing was used from Shen & Dillard (2005b). Ratcliff (2019) conveys that this measure by Shen & Dillard (2005b) is one of the most common ways to measure negative cognition as reactance in communication studies. Furthermore, in the accessible reactance literature on communication, this measure was mostly utilized, and thought listings are typically used to measure negative cognition (Ratcliff, 2019),

Negative cognition was measured in the following way. Shortly after participants read the persuasive message, they were asked to write out what they were thinking about the message. The collected data was coded in a four-step sequence by (1) segmenting data into psychological thought units, (2) identifying affective responses where a list of emotions by Shaver et al. (1987) was utilized, (3) assessing cognitive responses to remove irrelevant ones, and (4) coding data into supportive thoughts, neutral thoughts, or negative thoughts. Solely negative thoughts were used in subsequent data analyses. Negative thoughts are responses that disagree with the message, such as negative intention to act according to the advocated behaviour, to not respect the source, and more. Negative cognition was finally measured by counting the total number of negative thoughts for each participant (Kim et al., 2020). Two coders performed these four steps to compare answers and together decide on the number of negative thoughts per participant.

### *Threat to freedom*

The perceived threat of freedom – in terms of privacy – was measured by seven-point Likert scales with four items in total. Liang & Xue (2010) had two relevant items for perceived privacy threat in the context of spyware and computers; thus, the relevant items were modified to be for mobile apps and disease spread apps. The items were (1) The disease spread app above poses a threat to me, and (2) The disease spread app above threatens my freedom of privacy. Each item’s scale ranges from 1 = strongly disagree to 7 = strongly agree.

Two relevant items by Shin et al. (2017) were “When I install the disease spread app above, I think my privacy is not safe.” and “When I install the disease spread app above, I think our private data is used for another purpose which I did not intend.” The scales for each item range from 1 = strongly agree to 7 = strongly disagree. The four items’ alpha reliability was 0.874. Each participant’s response on the four scales was averaged to a composite score for later analysis.

#### *Trait proneness*

Trait proneness was measured with Hong and Faedda’s (1996) 11-item Trait Reactance Scale that has been validated in previous studies (Shen & Dillard, 2005a, b; Rosenberg & Siegel, 2018). After a wide search, it was found to be the most often used measure of trait proneness. Participants were presented with seven-point Likert scales, where 1 was strongly disagree, and 7 was strongly agree. Items include “I resist the attempts of others to influence me” and “I become angry when my freedom of choice is restricted”. Alpha reliability became 0.891. Each participant’s response on the eleven scales was averaged to a composite score to be used in further analysis.

#### *Anger and Fear*

Anger was measured with four items, and fear was measured with three items. Both anger and fear were measured with five-point scales. The items for fear were fearful, afraid, and scared. For anger, the items were irritated, angry, annoyed, and aggravated. Each scale ranged from 0 = none of this feeling to 4 = a great deal of this feeling. Originally, Dillard and Shen (2007) used the phrase “How the message made you feel” with the scales and items, but the phrase was adapted to this study to make clear to participants what was asked for. Respondents were asked “How did you feel while reading the earlier text about the disease spread app? Please tick a box between 0 “None of this feeling” to 4 “A great deal of this feeling”. Alpha reliability for fear was 0.959, and for anger, it was 0.930. For anger, a composite score was created as an average of each participant’s responses on anger’s four scales. The same was performed for fear except it was done for three scales. The composite scores were used for further analysis.

These measures have been carefully validated by Dillard and Shen (2007). According to Ratcliff (2019), this measure for anger is one of the most used ones



for reactance. Additionally, after assessing numerous accessible reactance studies, it was the most used one.

### **6.5 Pre-test of the Manipulation**

Before the final experiment, a pre-test was conducted to assess whether the manipulation was successful. The manipulation was as aforementioned that either the persuasive message focuses on personal or common good benefits of disclosing personal data to a disease spread app. As the messages were predicted to affect the dependent variable attitudinal intention or behavioural intention differently. Participants were first presented with one of the messages, and then the measure for behavioural intention followed by the attitudinal intention measure. Next, they were asked the manipulation question “To what extent do you feel the text promoted personal benefits or common good benefits for a disease spread app such as COVID-19 apps? Rate in the scale from 1 to 7 below.” At the end, they were asked about control variables age, gender, country of origin, nationality, and government trust. The manipulation check is in Appendix 5 in English and Appendix 6 in Norwegian.

In total, 50 responses were collected, 27 responses for the personal benefits persuasive message, and 23 for the common good benefits. All respondents were Norwegian with a somewhat high trust in government, except 8% who were Chinese and all had the highest possible score on trust in government, and 4% was Danes with high or somewhat high trust in government. Ages ranged from 21 to 71, with the mean at 35.4 years ( $SD = 12$ ), and 38% were male and 62% were female.

To analyse the data, a simple one-way independent analysis of variance was run with the dependent variable as behavioural intention ( $F = 5.104, p < .028$ ) or attitudinal intention's composite score ( $F = 6.864, p < .012$ ). The independent variable was the conditions. The results indicate a difference in attitudinal intention or behavioural intention after people are exposed to one of the two messages. Additionally, all respondents, except two, correctly identified whether the message they read was about the common good or personal benefits. Thus, 96% correctly identified the message type, while 4% did not. Therefore, the manipulation appeared successful.

### **6.6 Principal Component Analysis: Reactance as Factor Score for Analysis**

A principal component factor analysis with Varimax was run on negative cognition with anger. This generated one factor. Thus, factor scores were computed for each participant with Bartlett. To set up the model and compute the directions and magnitudes of paths between variables in the reactance process or conceptual framework, PROCESS macro was used. The factor scores were used as reactance in PROCESS macro.

To firstly decide whether a principal component analysis was appropriate, a KMO and Bartlett's test of sphericity were run. The overall measure of sampling adequacy was in a barely acceptable range at .5. Additionally, the Bartlett's test was significant ( $p < .05$ ). Hence, a principal component analysis was appropriate.

Next, it was found that negative cognition and anger loaded and had communalities above .5 on one factor. Moreover, one factor was deemed acceptable due to scree plots indicated one factor, eigenvalue was above 1 for one factor, and percentage variance indicated one factor. Therefore, H13 partially predicting reactance as a second order construct with anger and associated negative cognition as latent variables were partially supported, and the factor scores could be used in the PROCESS macro analysis.

## **7.0 Results**

### **7.1 One-way Independent Analysis of Variance: Whether in Analyses to Distinguish between those having and not having the COVID-19 app**

In the first step, two one-way independent analysis of variance (ANOVA) was run to assess whether it was necessary to split the data into the four groups, or whether it would be enough with two groups solely differing on whether participants were presented the common good or personal benefits message. One ANOVA was run on the group consisting of participants with and without the COVID-19 app and who were presented the common good benefits message. The other ANOVA was run on the group of participants who were presented the personal benefits message, including both those with and without the COVID-19 app.

Two one-way ANOVAs with behavioural intention as the dependent variable, and whether participants had the COVID-19 app as the independent variable, indicated a difference between those presented with the personal benefits message

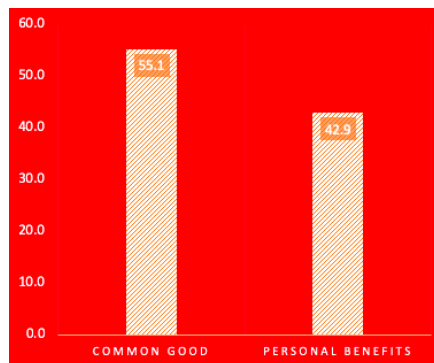
( $F(1, 138) = 11.402, p < .001$ ), and those presented with the common good benefits message ( $F(1, 46) = 81.562, p < .001$ ). Furthermore, the Levene's test's output conveyed  $p > .05$ , thus, evidence was found to that the assumption of homogeneity of variance was not violated. As this ANOVA confirmed a difference, it could indicate that the earlier mentioned self-selection bias was present.

## 7.2 Answering the Hypotheses

As the earlier mentioned self-selection bias could be present, main analyses were run on those without the COVID-19 app in order to answer the hypotheses. The main analyses' results were then compared to the result of same type of analyses for those with the COVID-19 app, to identify similarities or differences. All analyses were based on that reactance is a second order construct of anger and associated negative cognition. Except section 7.24, which clearly states that the subsection examines the effect of testing fear as a moderator of the path between reactance and threat to freedom or trait proneness in the proposed reactance process. Fear was not a significant moderator, as section 7.24 discusses more in-depth.

### 7.21 One-way Independent Analysis of Variance for Participants without the COVID-19 app: Proving Behavioural Intention to Disclose as Larger for the Common Good Condition

H3, H6, H9, and H12 predict among other things that behavioural intention to disclose personal data to a disease spread app is stronger when people are presented with the common good benefits message, relative to the personal benefits message; the two experimental conditions. To assess whether these predictions are supported, a one-way ANOVA was run. The dataset analysed in this section consists of those presented with the personal benefits message and common good benefits message, but it solely consists of the participants without the COVID-19 app.



**Figure 5** Simple bar mean of behavioural intention by whether participants have been presented the common good benefits or personal benefits message.

With behaviour as the dependent variable, and the experimental conditions as the independent variable, there was a significant effect of the conditions on behavioural intention to disclose personal data to a disease spread app,  $F(1, 154) = 4.702, p < .032$ . Additionally, a Levene's test's output conveyed  $p > .05$ , thus, support was found to that the assumption of homogeneity of variance was not violated. The common good benefits message ( $M_{CGB} = 55.12; p < .032$ ) revealed a significantly higher positive behavioural intention to disclose than for the personal benefits message ( $M_{PB} = 42.88; p < .032$ ). The means are illustrated in a bar chart in Figure 5. Thus, evidence was found to that the common good message has a stronger impact on behavioural intention to disclose personal data to a disease spread app than the personal benefits message, and this means that these parts of H3, H6, H9, and H12 are supported.

### **7.22 PROCESS macro: Mapping the Reactance Process Leading to Behavioural Intention to Disclose**

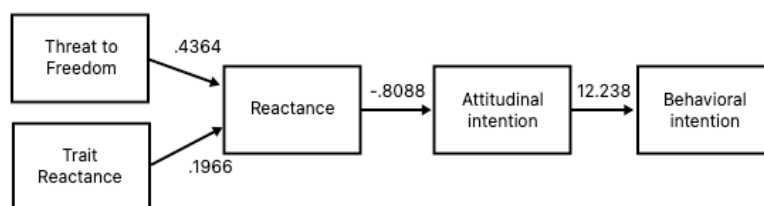
To answer the hypotheses on the reactance process' or conceptual framework's structure, and on the directions and magnitudes of antecedents to behavioural intention, PROCESS macro analyses were run (Model 6; with 5000 bootstrapping resamples) on participants without the COVID-19 app. In section 7.23, the same was performed on those with the COVID-19 app to compare the results between those with and without the app. The reactance process' and the conceptual framework's structure were deemed significant with 95% confidence if "0" was not within the 95% confidence interval. While directions and magnitudes of antecedents to behavioural intention were deemed significant or non-significant with p-values. These analyses were run both with and without covariates to test the robustness of the model. The control variables used in the analyses were education, trust in government, credibility of the persuasive message, gender, age, nationality, and country of origin. Additionally, multicollinearity was controlled for by examining that the standard errors of relevant coefficients were not too high. The standard errors are presented below in the analyses. Besides, one-way ANOVAs were run for each PROCESS macro analysis to ensure that the models were truly representative of the participants. The ANOVAs were reported when there was a discrepancy between ANOVA and PROCESS macro conclusions.

Before performing PROCESS macro analyses, the data had to be prepared for it. Firstly, reactance was, as earlier described, used in the analysis as factor scores of anger and negative cognition for each participant. As well aforementioned, measures with more than one item were included in the analysis as composite scores, while measures with one item were kept the same from data collection. Secondly, coefficients remained unstandardized as interpretation would not improve from standardization, considering that PROCESS macro involves logistic regression. Thirdly, dummy variables were made for categorical variables. Each categorical variable was recoded to the following:

- Nationality or origin: 1 = Norwegian or Norway, 0 = other.
- Age: 1 = those 30 or older, 0 = those younger than 30.
- Gender: 1 for male, 0 for female.
- Education: 1 = for higher education, 0 = below higher education or other.

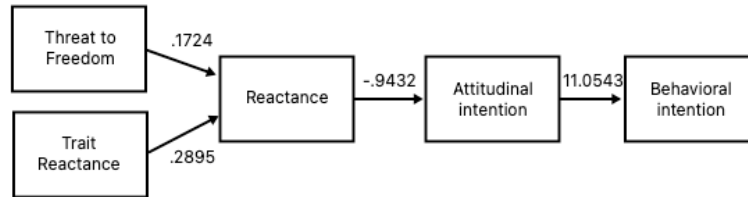
The remaining of this section are the results from PROCESS macro. The results are relevant for answering the hypotheses on the magnitudes and directions of the paths between variables in the conceptual framework and the reactance process. Furthermore, the structure of the conceptual framework and the reactance process was confirmed. The reduced model and covariates are in Table 2 on page 43.

For participants without the COVID-19 app, who were presented with the common good benefits message, the reactance process' and conceptual framework's structure were confirmed. As the PROCESS macro analysis conveys a significant ( $B = -4.3200, SE = 2.0307, 95\% CI [-8.2609; -.1769]$ ) sequential indirect effect of reactance – as anger and negative cognition – and attitudinal intention, in the reactance process from threat to freedom or trait proneness to disclosure intention. This model remained significant when controlling for all covariates ( $B = -4.5063, SE = 2.4375, 95\% CI [-9.4870; -.0286]$ ). Thus, H1 to H13 are in this aspect confirmed, and the model is in Figure 6.



**Figure 6** The reactance process when participants without the COVID-19 app were presented with the common good benefits message (without covariates).

For participants without the COVID-19 app, who were presented with the personal benefits message, the model was confirmed as well. The PROCESS macro analysis conveys a significant ( $B = -1.7976, SE = .9687, 95\% CI [-4.1387; -.4215]$ ) sequential indirect effect of reactance – as anger and negative cognition – and attitudinal intention in the reactance process from threat to freedom or trait proneness to behavioural intention. The model was significant when all covariates ( $B = -1.2189, SE = .09535, 95\% CI [-3.7065; -.0790]$ ) were controlled for. Hence, in this aspect H1 to H13 were confirmed. Figure 7 illustrates this model.



**Figure 7** The reactance process when participants without the COVID-19 app were presented with the personal benefits message (without covariates).

Regarding the magnitudes and the directions of the paths or regression coefficients between variables in the reactance process and conceptual framework, the results were the following. For those presented with the common good benefits message, and for the model without control variables, the regression coefficient of the path from threat to freedom to reactance was positive at .4364 ( $p < .0000$ ), and for trait proneness it was positive at .1966 ( $p < .0000$ ). Thus, trait reactance and threat to freedom increased reactance. From reactance to attitudinal intention, the path was negative at  $-.8088$  ( $p < .0303$ ), which means that reactance decreases attitudinal intention. The path from attitudinal intention to behavioural intention was positive at  $12.238$  ( $p < .0000$ ), and thus attitudinal intention increases behavioural intention. Figure 6 illustrates these sequential effects' magnitudes and directions. The predicted directions and thus magnitudes of each path were correct, thus, H1 to H13 were confirmed in this aspect.

For those presented with the personal benefits message and when not controlling for covariates, the path from threat to freedom to reactance was positive at .1724 ( $p < .0066$ ), and the trait proneness path was positive with .2895 ( $p < .0041$ ). Meaning that both these variables increased reactance. From reactance to attitudinal intention, the path was negative at  $-.9432$  ( $p < .0000$ ), thus, reactance decreases attitudinal intention. The path from attitudinal to behavioural intention was positive

with 11.0543 ( $p < .0004$ ), and therefore, attitudinal intent increases behavioural intent. Figure 7 illustrates these magnitudes and directions. The predicted directions and magnitudes of each path were correct for this group as well. Therefore, H1 to H13 were supported in these aspects for this group as well.

H7 to H12 as well predicts a difference in magnitudes of paths, which is the differences in the mentioned regression coefficients, depending on whether participants were presented the common good or personal benefits message. H7 forecasts that the path from threat to freedom of privacy to reactance is larger when the persuasive message focuses on personal benefits, relative to common good benefits, of disclosing personal data a disease spread app. A one-way ANOVA ( $(1, 154) = 3.955, p < .049$ ) with threat to freedom as the dependent variable, and the conditions as independent variable, conveyed that the personal benefits message ( $M_{TF_{PB}} = 3.6375; p < .049$ ) revealed a significantly higher positive threat to freedom than for the common good benefits message ( $M_{TF_{CG}} = 3.1216; p < .049$ ) among those without the COVID-19 app. Moreover, the assumption of homogeneity of variance was not violated as the Levene's test's output conveyed  $p > .05$ . Thus, threat to freedom should have a larger effect on reactance for the personal benefits message relative to the common good message, and therefore, H7 is confirmed. PROCESS macro conveyed that the path from threat to freedom to reactance was .4364 ( $p < .0000$ ) for those presented with the common good benefits message, and .1724 ( $p < .0066$ ) for those presented with the personal benefits message. With PROCESS macro's result, H7 is rejected, but the ANOVA is strong enough to override these results. Therefore, H7 is confirmed.

H10 forecasts that the path from trait proneness to reactance is larger when the persuasive message focuses on personal benefits of disclosure, compared to the common good benefits. Because the path is larger at .2895 ( $p < .0041$ ) for the personal benefits message, relative to the path at .1966 ( $p < .0000$ ) for the common good benefits message, H10 is confirmed.

H8 and H11 forecast that the path from reactance to attitudinal intention is larger when a persuasive message is about the personal benefits of disclosing, compared to the common good benefits. As the path is larger at -.9432 ( $p < .0000$ ) for those

exposed to the personal benefits message, compared to those exposed to the common good benefits message at  $-.6419$  ( $p < .0054$ ), H8 and H11 are supported.

H9 and H12 forecast that the path from attitudinal to behavioural intention is larger when the persuasive message focuses on benefits of disclosing for the common good, relative to personal benefits. Though, H12 predicts that the path would be smaller for the common good benefits message if the path's direction was negative. Since the path was positive and larger for the common good benefits message at  $12.238$  ( $p < .0000$ ) relative to  $11.0543$  ( $p < .0004$ ) for those presented the personal benefits message, H9 and H12 are supported. In addition, H3 and H6 predict that the reactance process and conceptual framework lead to a stronger behavioural intention for the common good benefits message. These results further support these predictions in H3 and H6, as the path between attitudinal and behavioural intention is larger for the common good benefits message.

**Table 2** The reduced model and belonging covariates for participants without the COVID-19 app.

<i>Reduced Model</i>	<b>Common Good Benefits</b>			<b>Personal Benefits</b>		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
TF => R	.4364	.0391	.0000	.1724	.0618	.0066
TP => R	.1966	.0400	.0000	.2895	.0979	.0041
R => ATT	-.8088	.2235	.0054	-.9432	.1630	.0000
ATT => BEH	12.238	.7891	.0000	11.0543	2.9537	.0004
<i>Covariates</i>						
TF => R						
TP => R						
Age	.0020	.0706	.9777	-.0281	.3259	.9315
Origin	-.0680	.0577	.2432	-.8518	.5615	.1338
Gender	.0325	.0358	.3665	-.6332	.3358	.0635
Education	.0591	.1483	.6915	.7152	.2484	.0053
Credibility	.0246	.0358	.3665	-.1378	.0577	.0196
Nationality	.1324	.0575	.0243	.3749	.5783	.5189
Trust in Government	-.0325	.0256	.2085	-.1246	.1133	.2752
R => ATT						
Age	-.1341	.1962	.4967	-.0776	.5680	.8917
Origin	.1095	.1622	.5019	.5669	.9944	.5705
Gender	-.4062	.1001	.0001	.3427	.5999	.5697
Education	-.0684	.4128	.8689	-.5464	.4578	.2367
Credibility	-.0655	.0431	.1337	.0905	.1046	.3899
Nationality	.4231	.1661	.0132	-.6479	1.0107	.5237
Trust in Government	.0803	.0721	.2695	-.0998	.1991	.6178
ATT => BEH						
Age	-1.8026	1.4331	.2130	6.4714	10.674	.5463



Origin	-1.0680	1.1844	.3706	5.5435	18.729	.7681
Gender	-1.3517	.8153	.1023	-18.9702	11.298	.0977
Education	2.1090	3.0046	.4853	8.3255	8.6910	.3415
Credibility	-.0630	.3196	.8443	4.2572	2.1548	.0347
Nationality	.1304	1.2675	.9184	4.3753	19.048	.2297
Trust in Government	1.906	2.987	.5234	19.44	3.7487	.0000

TF: Threat to Freedom; R: Reactance; TP: Trait Proneness; ATT: attitudinal intention; BEH: behavioural intention.

**7.23 Comparison of Those with the COVID-19 app to Those without it**

Next, the aim was to compare participants who had and had not downloaded the COVID-19 app, to find similarities and discrepancies in terms of the hypotheses. Therefore, the same PROCESS macro analysis and the same one-way ANOVA as previously run on those without the COVID-19 app, were run on those with the app, who either were presented the personal benefits or common good benefits message. In the analyses, reactance consisted of anger and negative cognition.

Like those with the COVID-19 app, there was a significant effect of the conditions on behavioural intention to disclose data to a disease spread app,  $F(1, 138) = 11.402, p < .001, Levene\ statistic\ significance = .232$ . As well like those without the app, the common good benefits message ( $M_{CGB} = 89.67; p < .001$ ) had a significantly higher positive behavioural intention to disclose than the personal benefits message ( $M_{PB} = 80.79; p < .001$ ). Therefore, the common good message has a stronger impact on behavioural intention to disclose personal data to a disease spread app than the personal benefits message. Moreover, the parts of H3, H6, H9, and H12 predicting this impact are supported for those with the app as well.

Table 3 conveys that the reactance process’ and conceptual framework’s proposed structure were supported for those who had the COVID-19 app as well. Thus, these parts of H1 to H13 were confirmed for those with the app as well.

**Table 3** The significance of the reactance process’ and conceptual framework’s structure for those with the COVID-19 app (with and without covariates)

<i>Without Covariates</i>	B	SE	CI
Common Good Benefits Condition	-.8427	1.8204	-1.8204; -.0742
Personal Benefits Condition	-2.9043	1.451	-6.0249; -.4390

<i>With covariates</i>			
Common Good Benefits Condition	-.6242	.3515	-1.3678; -.0081
Personal Benefits Condition	-3.3017	1.6653	-6.8165; -.2527

**Table 4** The reduced model and belonging covariates for participants with the COVID-19 app.

	<b>Common Good Benefits</b>			<b>Personal Benefits</b>		
<i>Reduced Model</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
TF => R	.2499	.0952	.0107	.2906	.1580	.0388
TP => R	.2061	.0969	.0371	.3359	.1802	.0473
R	-.3022	.0993	.0033	-.8968	1.3069	.0000
ATT => BEH	11.155	1.6465	.0000	11.145	1.0887	.0000
<i>Covariates</i>						
TF => R						
TP => R						
Age	.3240	.2109	.1294	.1042	.1371	.4499
Origin and nationality	.1398	.1045	.1858	-.0999	.0620	.1125
Gender	.5520	.2294	.0190	-.2512	.1513	.1020
Education	1.5475	.4286	.0006	.4343	.2745	.1189
Credibility and trust in government	.0661	.1231	.5930	.1120	.0683	.1066
R => ATT						
Age	-.4747	.1785	.0099	.2055	.1061	.0576
Origin and nationality	.0374	.0881	.6729	-.0596	.0488	.2274
Gender	-.0036	.1992	.9858	-.3230	.1192	.0088
Education	-1.2393	.3909	.0024	.7647	.2160	.0008
Credibility and trust in government	.2267	.1025	.0307	.0720	.0538	.1862
ATT =>						
Age	-3.5919	1.9899	.0759	-.6318	1.0626	.5544
Origin and nationality	2.1080	.9321	.0272	-.0580	.4801	.9042
Gender	7.8445	1.2048	.0004	-.4765	1.2274	.6992
Education	-5.5625	4.4481	.2158	2.1472	2.3086	.3562
Credibility and trust in government	6.5535	1.1249	.0000	1.6218	.5305	.0034

TF: Threat to Freedom; R: Reactance; TP: Trait Proneness; ATT: attitudinal intention; BEH: behavioural intention. To deal with multicollinearity, origin and nationality or credibility and trust in government were combined into factors scores with principal component analysis.

Table 4 above conveys the magnitudes and directions of the path coefficients in the proposed reactance process' and conceptual framework's structure. Threat to freedom or trait proneness influenced positively and increased reactance, and it was smaller for the common good benefits message, relative to the personal benefits message. Reactance next influenced attitudinal intention negatively and increased

it. The path was smaller for the common good benefits message, relative to the personal benefits message. Finally, attitudinal intention influenced positively and increased behavioural intention. The path was larger for the common good benefits relative for the personal benefits message, but barely so. Of these reasons, the hypotheses – H1 to H13 – on the directions and magnitudes of the paths between variables in the conceptual framework, or reactance process, are supported just as for the participants without the COVID-19 app. In addition, as predicted, the path between attitudinal and behavioural intention was larger for those presented with the common good benefits message, thus, the process leads to a larger behavioural intention for those presented the common good benefits message. This gives further support to H3 and H6.

#### **7.24 Reactance Moderated by Fear**

From analysing fear as a moderator of the path between reactance and threat to freedom or trait proneness in the conceptual framework. For participants without the COVID-19 app, it was not found to be significant for either those presented with the common good benefits or the personal benefits message. For those presented with the common good message, an analysis with PROCESS macro model 7 conveyed that the fear moderator was insignificant ( $p < .4890$ ) for the path between threat to freedom and reactance. Fear did not significantly moderate ( $p < .7659$ ) the path between trait proneness and reactance. For participants who were presented with the personal benefits message, PROCESS macro model 7 conveyed that the moderator was insignificant at  $p < .8243$  for the path between threat to freedom and reactance. Fear was as well an insignificant moderator of the path between trait reactance and reactance ( $p < .367$ ). Thus, H14 is rejected as it predicts that fear moderates the path between reactance and threat to freedom or trait proneness positively by increasing it in the proposed reactance process, which thus indirectly decreases attitudinal intention and behavioural intention.

### **8.0 Discussion**

A web-based experiment was conducted with 296 participants and with two conditions. Differing in whether participants were presented with a persuasive message on common good benefits or personal benefits of disclosing personal data to disease spread app. The aim was to understand whether there is a higher behavioural intention to adopt a disease spread app when individuals are presented with the common good benefits message relative to the personal benefits message.

Furthermore, the aim was as well to understand how the reactance process is structured when driving behavioural intention to disclose.

It was predicted that behavioural intention to disclose personal data to a disease spread app would be larger for those presented the common good benefits message, relative to those presented with the personal benefits message (H3, H6, H9, and H12), which the results confirmed. The strength of behavioural intention is driven by the proposed reactance process. The predictions regarding the reactance process were that it would begin when one of the persuasive messages were presented to an individual, and that it would be a chains-of-effects preceding behavioural intention to disclose (H1 to H14). The process begins with threat to freedom or trait proneness, which positively influences and thus increases reactance (H1 & H4). Where the path between reactance and trait proneness or threat to freedom is larger for those presented the personal benefits message, relative to those presented the common good benefits message (H7 & H10).

Next, it was predicted that reactance negatively influences and thus decreases attitudinal intention towards disclosing data (H2, H5, & H13). In which the path between reactance and attitudinal intention is larger for those presented the personal benefits message, relative to those presented with the common good benefits message (H8 & H11). Lastly, attitudinal intention was predicted to increase and positively influence behavioural intention to disclose (H3 & H6). Where the path between attitudinal and behavioural intention was predicted to be larger for those presented to the common good benefits message, compared to those presented the personal benefits message (H9 & H12). Except, H6 and H12 convey that the path could be negative when the reactance process starts from trait reactance. In that case, attitudinal intention would decrease behavioural intention. Then, the path would be smaller for the common good benefits message relative to the personal benefits message. Furthermore, reactance was defined as a second order construct with the latent variables anger and associated negative cognition in this proposed reactance process (H1, H2, H4, H5, H7, H8, H10, H11 and H13). In addition, H14 predicts that fear moderates the paths between reactance and trait proneness or threat to freedom in the proposed reactance process. Fear was predicted to positively influence, and thus increases the paths, which therefore indirectly decreases attitudinal intention and behavioural intention. The proposed reactance

process' structure was in line with the structure most often found in the literature (Quick et al., 2011; Shen & Dillard, 2005b; Richards & Larsen, 2016; Reynolds-Tylus, 2019b; Weiler, 2020; Petegem et al., 2015; Lowry & Moody, 2015; Boukamcha, 2016; Steindl et al., 2015).

All predictions connected to the structure of the reactance process were confirmed, except H13 was disconfirmed. In addition, the path between attitudinal and behavioural intention was positive, not negative, as H6 and H12 suggest it can be either. Below is a summary of what the predictions were in connection with the hypotheses, along with the final outcomes discovered from the data analyses.

**Table 5** Summary of Hypotheses Results.

<b>Hypotheses</b>	<b>Prediction</b>	<b>Outcome</b>
<b>H1:</b> Threat to freedom of privacy positively influences and thus increases reactance, which consists of anger and associated negative cognition.	Support	Supported
<b>H2:</b> Continuing from H1, reactance negatively influences and thus decreases attitudinal intention.	Support	Supported
<b>H3:</b> Following H2, attitudinal intention positively influences and thus increases behavioural intention, leading to a stronger behavioural intention when the common good benefits message is presented.	Support	Supported
<b>H4:</b> Trait proneness positively influences and thus increases reactance, as anger and associated negative cognition.	Support	Supported
<b>H5:</b> Subsequently to H4, reactance negatively influences and thus decreases attitudinal intention.	Support	Supported
<b>H6:</b> Continuing from H5, attitudinal intent positively influences and thus increases, or negatively affects and thus decreases, behavioural intent, leading to a stronger behavioural intent when the common good benefits message is presented.	Support	Supported
<b>H7:</b> Threat to freedom of privacy influences reactance positively and is larger when the message focuses on personal benefits.	Support	Supported
<b>H8:</b> Proceeding from H7, reactance influences attitudinal intention negatively and is larger when the message is about the personal benefits.	Support	Supported
<b>H9:</b> Continuing from H8, attitudinal intention influences behavioural intent positively and is larger when the message is on the common good benefits.	Support	Supported
<b>H10:</b> Trait proneness influences reactance positively and is larger when the message is on the personal benefits.	Support	Supported

<b>H11:</b> Progressing from H10, reactance influences attitudinal intent negatively and is larger when the message is on the personal benefits.	Support	Supported
<b>H12:</b> After H11, attitudinal intention influences behavioural intention positively or negatively, and is larger for the message on common good benefits if the path's direction is positive, but smaller if negative.	Support	Supported
<b>H13:</b> Reactance as anger and negative cognition negatively mediates the reactance process, therefore, it decreases attitudinal intention directly, and behavioural intention indirectly.	Support	Supported
<b>H14:</b> Fear positively moderates and increases the path from reactance to threat to freedom or trait proneness in the reactance process, which indirectly decreases attitudinal intent and behavioural intent.	Support	Rejected

## 8.1 Implications and Limitations

### 8.11 Implications for Theory

The research has two main theoretical implications for academia. Firstly, this study contributes to the reactance literature on communication in multiple ways. Threat to freedom as privacy in the reactance process has not been studied before in the context of disease spread app promotion messages focused on the personal or common good benefits of disclosing personal data to the app. It was found significant. Thus, scholars can in the future define threat to freedom as privacy in suitable contexts, to test it further and make more precise models. Moreover, this study offers further support to the reactance process structure utilized in this study. In addition, reactance literature reviews have called for studies to examine other emotions such as fear in relation to reactance. While the study did not find that fear played a significant role, this finding does not necessarily mean that fear is unimportant. Because it could yet be relevant in other study contexts.

Secondly, the findings could provide scholars a picture of why individuals are not disclosing data to disease spread apps. The reasons include privacy concerns, trait proneness, reactance, threat to freedom, and negative attitudes towards disclosing personal data to a disease spread app. Besides, the findings can as well provide a picture on how individuals can be motivated to disclose data to disease spread apps. Motivations can be low reactance, low trait proneness, low threat to freedom, and positive attitudes towards disclosing personal data to a disease spread app. Furthermore, this study found that motivation to disclose is generally larger when

an individual is presented with a persuasive message on common good benefits of disclosing personal data to a disease spread app.

### **8.12 Implications for Practice**

This research has practical implications for disease spread app developers, marketers, and governments. The study has presented persuasive messages' – focused either on common good or personal benefits of disclosing personal data to a disease spread app – influence on individuals' disclosure to disease spread apps. Intention to disclose was found to be larger for those presented with the common good benefits message compared to those presented with the personal benefits message. Therefore, promotional messages can increase disease spread app adoption by focusing more on common good benefits of disclosure than personal benefits of disclosure, though, conveying both types of benefits can be beneficial.

Moreover, threat to freedom of privacy or trait proneness was significant in increasing reactance in the reactance process as earlier mentioned. Additionally, the higher threat to freedom of privacy, the higher trait proneness should be as well. Therefore, threat to freedom as privacy and trait proneness decrease attitudinal and behavioural intention towards the promoted behaviour in the message. This means that privacy concerns should be overcome. Hence, it is crucial for disease app distributors to monitor what privacy concerns are preventing individuals from adopting disease spread apps. There are multiple ways to address privacy concerns with disease spread apps (Fox et al., 2021). For example, by communicating privacy protections and reasons for requesting people to disclose data (Fox et al., 2021). Additionally, disease app distributors should avoid evoking trait proneness or reactance by considering what aspects of disease spread apps could evoke reactance or trait proneness. If they cannot avoid reactance or trait proneness from being evoked, then they should consider how they can remedy it.

### **8.13 Limitations and Future Research**

As with any study, the current study has limitations that should be acknowledged. Moreover, the limitations can provide opportunities for future studies. First, many factors may explain why people disclose personal data to a disease spread app or not. Participants in this study may as well have been indirectly influenced by other factors than their privacy being threatened, in why they would not adopt the disease spread app presented in the experiment. For example, people may not believe that

the app is efficient in combating COVID-19, which some participants voiced as an issue of disease spread apps in the thought listing. Future research should examine what these other factors are to remedy that many are not adopting the disease apps. For instance, if many do not adopt disease spread apps due to not believing in their efficiency in combating a pandemic such as COVID-19, then promotional messages could benefit from being more convincing in why the apps are efficient.

Second, the measures taken to deal with a pandemic, such as COVID-19, may vary over time. This study was performed before there was a wide offer to receive a COVID-19 vaccine. When a vaccine is more widely accessible and more people have taken it, then that may affect peoples' behavioural intention to download a disease spread app, because people may perceive the app as less necessary. Additionally, it is unknown whether these results are generalizable to epidemics. If one draws parallels to the global environmental crisis, many in the West do not care as much – as they are not experiencing the consequences of it to a large degree (Stoknes, 2015). Though, those experiencing the consequences to a larger degree worry more about the climate crisis (Stoknes, 2015). Thus, one could expect similar results for an epidemic if it largely affects a local community. Future research could replicate this study for epidemics utilizing disease spread apps.

Third, web-based experiments have been criticized to have less experimental controls and difficulties in ensuring reliability and internal validity compared to laboratory experiments (Becker et al., 2020). Though, a web-based experiment offers high control, and it delivered a more realistic setting for the participants' decision processes (Becker et al., 2020). Additionally, often there are more visual elements in real promotional messages for disease spread apps than what the final experiment had. For visuals not to affect the results, it was kept at a minimum.

Fourth, most respondents were Norwegian. Therefore, an individualistic culture was highly represented in the study results, while those with collectivistic cultures were minimally represented. As reactance can differ between collectivistic and individualistic cultures, future research can replicate this study's research to find out whether there are differences between collectivistic and individualistic cultures.



Fifth, survey errors and biases could have occurred in the research design. A social bias may have occurred as many could think that using a disease spread app is socially desirable, or many could experience that their privacy is invaded as they are asked about personal information such as their trait proneness. To prevent these biases from occurring, they were ensured that their anonymity was guaranteed, and they were ensured that their data would be treated with uttermost confidentiality. In addition, a self-selection bias could have occurred such as due to a convenience sampling method being used. Though, this potential bias is dealt with in the analyses by distinguishing between those having and not having the COVID-19 apps. Lastly, a bias could have occurred due to some respondents' lack in writing skills, based on the ambiguity in their answers. Two coders were used to deal with this survey error.

Sixth, as mentioned, prior literature reviews recommend research to examine the emotion fear in relation to reactance. This study did not find fear as a significant moderator of the path between reactance and threat to freedom or trait proneness in the proposed reactance process. Future research can examine fear as a mediator to reactance to further assess whether fear can be a relevant variable to include in relation to reactance. Additionally, fear may yet be relevant in other study contexts, and it should still be studied in contexts where it appears relevant.

Seventh, the pre-test confirms that the manipulation worked, but the same cannot be concluded for the final experiment. However, the pre-test worked on 96% of respondents, and the results were significant, which indicates that the manipulation should be successful for the final experiments as well.

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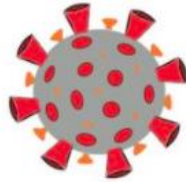
## Appendix 1: The Persuasive Message on a Societal Level

### Last ned COVID-19 sykdomsspredningsappen for å beskytte andre!

Hensikten til en sykdomsspredningsapp er å begrense en pandemis spredning, for eksempel COVID-19. Appen sporer smittede for å varsle brukere om å være eller ha vært nærme den smittede.

Personvernsvilkår:

COVID-19 sykdomsspredningsappen samler inn informasjon om hvem som er smittet og samfunnets lokasjoner og bevegelser over tid. Informasjonen deres er samlet inn for følgende formål:



- Å forbedre app-funksjonalitet til samfunnets fordel.
- Å varsle samfunnsmedlemmer om de har vært nærme noen smittede eller varsle andre at en er smittet.
- Bidra til forskning for potensielt samfunnets fordel.

I tillegg er samfunnets personvern ivaretatt på følgende måter:

- Samfunnets lokasjoner og bevegelser er skjult for andre brukere.
- Samfunnsmedlemmer er anonyme.
- Samfunnets delte informasjon holdes trygg.
- Bruk av Bluetooth til å samle inn anonym informasjon om samfunnet.

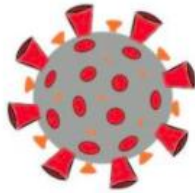
### Download the COVID-19 disease spread app to protect others!

A disease spread app aims to limit a pandemic's spread, such as COVID-19.

The apps track infected individuals to warn app users of being or having been close to somebody infected.

Privacy Policies:

The COVID-19 disease spread app collects information on whom is infected and societies' locations and movements over time. Their information is collected for the following purposes:



- To improve app functionality for societies' benefit.
- To warn societal members whether they have been close to somebody infected or warn others that they are infected.
- Advance research for potentially societies' benefit.

Also, societies' privacy is maintained in the following ways:

- Societies' locations and movements is hidden for other users.
- Societal members are anonymized.
- Societies' shared information is kept safe.
- Use of Bluetooth to collect anonymous information about societies.

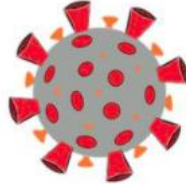
## Appendix 2: The Persuasive Message on an Individual Level

### Last ned COVID-19 sykdomsspredningsappen for å beskytte deg selv!

Hensikten til en sykdomsspredningsapp er å begrense en pandemis spredning, for eksempel COVID-19. Appen sporer smittede for å varsle brukere om å være eller ha vært nærme den smittede.

Personvernsvilkår:

COVID-19 sykdomsspredningsappen samler inn informasjon om hvem som er smittet og dine lokasjoner og bevegelser over tid. Informasjonen din er samlet inn for følgende formål:



- Å forbedre app-funksjonalitet til din fordel.
- Å varsle deg om du har vært nærme noen smittede eller varsle dine nærmeste at du er smittet.
- Bidra til forskning for potensielt din egen fordel.

I tillegg er ditt personvern ivarettatt på følgende måter:

- Dine lokasjoner og bevegelser er skjult for andre brukere.
- Du er anonym.
- Din delte informasjon holdes trygg.
- Bruk av Bluetooth til å samle inn anonym informasjon om deg.

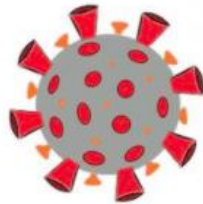
### Download the COVID-19 disease spread app to protect yourself!

A disease spread app aims to limit a pandemic's spread, such as COVID-19.

The apps track infected individuals to warn users of being or having been close to an infected.

Privacy Policies:

The COVID-19 disease spread app collects information on whom is infected and your locations and movements over time. Your information is collected for the following purposes:



- To improve app functionality for your benefit.
- To warn you whether you have been close to somebody infected or warn your close ones that you are infected.
- Advance research for potentially your own benefit.

Also, your privacy is maintained in the following ways:

- Your locations and movements are hidden for other users.
- You are anonymized.
- Your shared information is kept safe.
- Use of Bluetooth to collect anonymous information about you.

## Appendix 3: The Experiment in Norwegian

**Hei og takk for at du tar deg tid til å bidra til denne undersøkelsen!**

Dette studiet handler om sykdomsspredningsapper. Du vil se en tekst om en COVID-19 app, og du vil bli stilt spørsmål tilknyttet teksten. Undersøkelsen vil ta omtrent 5 minutter, og utover denne siden er det 4 sider totalt.

Dataene din vil bli behandlet med størst konfidensialitet og vil kun bli rapportert i et aggregert format. Innsamlede data lagres i en Qualtrics-sikker database som gjør deg anonym. Kun forskeren til dette studiet har tilgang til dette.

Deltakelse i dette studiet er frivillig. Derfor kan du trekke deg når som helst ved å lukke nettleseren eller fanen.

Den nåværende COVID-19-pandemien gjør datainnsamlingen spesielt vanskelig, derav er ditt bidrag høyt verdsatt!

Dersom du har noen spørsmål om undersøkelsen, ta gjerne kontakt med Camila Snell Mørch på [camilasm93@gmail.com](mailto:camilasm93@gmail.com).

Samtykker du i å delta i dette studiet?

Jeg samtykker

Jeg samtykker ikke

NESTE SIDE

Vennligst les følgende tekst nøye siden spørsmålene i resten av undersøkelsen er basert på denne.

### Last ned COVID-19 sykdomsspredningsappen for å beskytte andre!

Hensikten til en sykdomsspredningsapp er å begrense en pandemis spredning, for eksempel COVID-19. Appen sporer smittede for å varsle brukere om å være eller ha vært nærme den smittede.

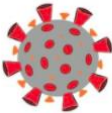
Personvernsvilkår:

COVID-19 sykdomsspredningsappen samler inn informasjon om hvem som er smittet og samfunnets lokasjoner og bevegelser over tid. Informasjonen deres er samlet inn for følgende formål:

- Å forbedre app-funksjonalitet til samfunnets fordel.
- Å varsle samfunnsmedlemmer om de har vært nærme noen smittede eller varsle andre at en er smittet.
- Bidra til forskning for potensielt samfunnets fordel.

I tillegg er samfunnets personvern ivarett på følgende måter:

- Samfunnets lokasjoner og bevegelser er skjult for andre brukere.
- Samfunnsmedlemmer er anonyme.
- Samfunnets delte informasjon holdes trygg.
- Bruk av Bluetooth til å samle inn anonym informasjon om samfunnet.



Vennligst les følgende tekst nøye siden spørsmålene i resten av undersøkelsen er basert på denne.

### Last ned COVID-19 sykdomsspredningsappen for å beskytte deg selv!

Hensikten til en sykdomsspredningsapp er å begrense en pandemis spredning, for eksempel COVID-19. Appen sporer smittede for å varsle brukere om å være eller ha vært nærme den smittede.


Personvernsvilkår:

COVID-19 sykdomsspredningsappen samler inn informasjon om hvem som er smittet og dine lokasjoner og bevegelser over tid. Informasjonen din er samlet inn for følgende formål:

- Å forbedre app-funksjonalitet til din fordel.
- Å varsle deg om du har vært nærme noen smittede eller varsle dine nærmeste at du er smittet.
- Bidra til forskning for potensielt din egen fordel.

I tillegg er ditt personvern ivarett på følgende måter:

- Dine lokasjoner og bevegelser er skjult for andre brukere.
- Du er anonym.
- Din delte informasjon holdes trygg.
- Bruk av Bluetooth til å samle inn anonym informasjon om deg.



Hvor sannsynlig er det at du tar i bruk appen i nær fremtid hvis den er tilgjengelig for deg? Velg i % med glidebryteren nedenfor. 0% betyr at jeg absolutt ikke ville laste ned denne appen, og 100% betyr at jeg absolutt ville laste ned denne appen.

0 10 20 30 40 50 60 70 80 90 100

%

Å ta i bruk appen over er (velg en boks fra 1 til 7 for hvert bipolare adjektiv under):

Tåpelig	<input type="radio"/>	Klokt
Dårlig	<input type="radio"/>	Bra
Ugunstig	<input type="radio"/>	Gunsig
Negativt	<input type="radio"/>	Positivt
Uønsket	<input type="radio"/>	Ønsket
U nødvendigg	<input type="radio"/>	Nødvendig
Skadeligg	<input type="radio"/>	Fortstellig

Vennligst skriv hva enn du tenker på etter å ha lest teksten om sykdomsreprengningsappen over:

Sykdomsreprengningsappen over utgjør en trussel for meg.

Sterkt ueigg |  | Sterkt ueigg

Sykdomsreprengningsappen over truer min frilhet til personvern.

Sterkt ueigg |  | Sterkt ueigg

Når jeg laster ned sykdomsreprengningsappen over, så tror jeg at personvernet mitt ikke er trygt.

Sterkt ueigg |  | Sterkt ueigg

Når jeg laster ned sykdomsreprengningsappen over, så tror jeg at vår private data brukes til et annet formål som jeg ikke hadde til hensikt.

Sterkt ueigg |  | Sterkt ueigg

Hva felle du imens du leste den tidligere teksten om sykdomsreprengningsappen? Merk av en boks mellom 0 "Ikke noe av denne følelsen" og 4 "Mye av denne følelsen" for hver følelse.

Engstellig   Ikke noe av denne følelsen	<input type="radio"/>	Mye av denne følelsen
Redd   Ikke noe av denne følelsen	<input type="radio"/>	Mye av denne følelsen
Skreent   Ikke noe av denne følelsen	<input type="radio"/>	Mye av denne følelsen
Irritert   Ikke noe av denne følelsen	<input type="radio"/>	Mye av denne følelsen
Sint   Ikke noe av denne følelsen	<input type="radio"/>	Mye av denne følelsen
Plaget   Ikke noe av denne følelsen	<input type="radio"/>	Mye av denne følelsen
Forarget   Ikke noe av denne følelsen	<input type="radio"/>	Mye av denne følelsen

Har du nedlastet COVID-19 appen om den er tilgjengelig i ditt land?

Ja

Nei

NESTE SIDE

Den neste serien med spørsmål er 11 spørsmål om deg. For å indikere i hvilken grad følgende utsagn representerer deg, vil jeg at du merker av en boks fra 1 til 7 fra sterkt uenig til sterkt enig.

**Jeg blir frustrert når jeg ikke kan ta frie og selvstendige avgjørelser.**

Sterkt uenig |        | Sterkt enig

**Jeg blir sint når valgfriheten min er begrenset.**

Sterkt uenig |        | Sterkt enig

**Det irriterer meg når noen peker ut ting som er åpenbare for meg.**

Sterkt uenig |        | Sterkt enig

**Regelverk utløser en følelse av motstand hos meg.**

Sterkt uenig |        | Sterkt enig

**Jeg synes det er stimulerende å motsatte andre.**

Sterkt uenig |        | Sterkt enig

**Når noe er forbudt, tenker jeg vanligvis "det er akkurat det jeg skal gjøre."**

Sterkt uenig |        | Sterkt enig

**Jeg motstår andres forsøk på å påvirke meg.**

Sterkt uenig |        | Sterkt enig

**Det gjør meg sint når en annen person blir fremstilt som en modell for meg å følge.**

Sterkt uenig |        | Sterkt enig

**Når noen tvinger meg til å gjøre noe, har jeg lyst til å gjøre det motsatte.**

Sterkt uenig |        | Sterkt enig

**Jeg anser råd fra andre som inntrengende.**

Sterkt uenig |        | Sterkt enig

**Råd og anbefalinger får meg til å gjøre det motsatte.**

Sterkt uenig |        | Sterkt enig

[FORRIGE SIDE](#) | [NESTE SIDE](#)

**BI** HANDELSHØYSKOLEN

**Vennligst oppgi i hvilken grad du støler på at staten alltid gjør det rette for folket:**

Sterkt imot |      | Sterkt i favor

**Ranger teksten du har lest tidligere fra 1 til 8 for hvert bipolare adjektiv nedenfor:**

Ikke troverdig	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	Troverdig
Amatør	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	Profesjonell
Ikke til å stole på	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	Til å stole på

[FORRIGE SIDE](#) | [NESTE SIDE](#)

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Hvilket kjønn identifiserer du deg med?

- Mann  
 Kvinne

Skriv inn alderen din:

Hva er din høyest oppnådde grad?

- Barneskole  
 Ungdomskole  
 Videregående  
 Bachelor  
 Master  
 Doktorgrad  
 Annet

Hva er ditt opprinnelsesland?

Hva er nasjonaliteten din?

[FORRIGE SIDE](#) [NESTE SIDE](#)



## Appendix 4: The Experiment in English

Hello and thank you for taking time to contribute to this survey!

This study is about disease spread apps. You will see a text about a COVID-19 app, and you will be asked questions related to the text. The survey will take about 5 minutes, and beyond this page there are 4 pages in total.

Your data will be treated with greatest confidentiality and solely will be reported in aggregated format. The collected data will be saved in a Qualtrics-secure database which makes you anonymous. Solely the researcher of this study has access to the database. Participation in the study is voluntary. Therefore, you can withdraw at any point in time by closing your internet browser or tab.

The current COVID-19 pandemic makes data collection particularly difficult, thus, your contribution is highly appreciated!

If you have any questions about the survey, feel free to contact Camila Sneli Mørch on [camilasm93@gmail.com](mailto:camilasm93@gmail.com).

Do you consent to participate in this study?

- I consent
- I do not give consent

NEXT PAGE

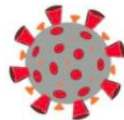
Please read the following text carefully as the questions in the survey are based on it.

### Download the COVID-19 disease spread app to protect others!

A disease spread app aims to limit a pandemic's spread, such as COVID-19. The apps track infected individuals to warn app users of being or having been close to somebody infected.

Privacy Policies:

The COVID-19 disease spread app collects information on whom is infected and societies' locations and movements over time. Their information is collected for the following purposes:



- To improve app functionality for societies' benefit.
  - To warn societal members whether they have been close to somebody infected or warn others that they are infected.
  - Advance research for potentially societies' benefit.
- Also, societies' privacy is maintained in the following ways:
- Societies' locations and movements is hidden for other users.
  - Societal members are anonymized.
  - Societies' shared information is kept safe.
  - Use of Bluetooth to collect anonymous information about societies.

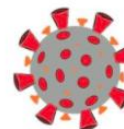
Please read the following text carefully as the questions in the survey are based on it.

### Download the COVID-19 disease spread app to protect yourself!

A disease spread app aims to limit a pandemic's spread, such as COVID-19. The apps track infected individuals to warn users of being or having been close to an infected.

Privacy Policies:

The COVID-19 disease spread app collects information on whom is infected and your locations and movements over time. Your information is collected for the following purposes:



- To improve app functionality for your benefit.
  - To warn you whether you have been close to somebody infected or warn your close ones that you are infected.
  - Advance research for potentially your own benefit.
- Also, your privacy is maintained in the following ways:
- Your locations and movements are hidden for other users.
  - You are anonymized.
  - Your shared information is kept safe.
  - Use of Bluetooth to collect anonymous information about you.

How likely are you to adopt the app in the near future if it is available to you? Please choose a % in the slider below. 0% means I would certainly not download this app, and 100% means I would certainly download this app.

0 10 20 30 40 50 60 70 80 90 100  
%

Adopting the app above is (please choose a box from 1 to 7 for each bipolar adjective below):

	Foolish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Wise
<input type="text"/>	Bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Good
<input type="text"/>	Unfavorable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Favorable
<input type="text"/>	Negative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Positive
<input type="text"/>	Undesirable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Desirable
<input type="text"/>	Unnecessary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Necessary
<input type="text"/>	Detrimental	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Beneficial

Please write whatever is in your mind after reading the text about the disease spread app above:

The disease spread app above poses a threat to me.

Strongly disagree |       | Strongly agree

The disease spread app above threatens my freedom of privacy.

Strongly disagree |       | Strongly agree

When I install the disease spread app above, I think my privacy is not safe.

Strongly disagree |       | Strongly agree

When I install the disease spread app above, I think our private data is used for another purpose which I did not intend.

Strongly disagree |       | Strongly agree

How did you feel while reading the earlier text about the disease spread app? Please tick a box between 0 "None of this feeling" to 4 "A great feeling of this" for each feeling.

<input type="text"/>	Fearful   None of this feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal of this feeling
<input type="text"/>	Afraid   None of this feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal of this feeling
<input type="text"/>	Scared   None of this feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal of this feeling
<input type="text"/>	Irritated   None of this feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal of this feeling
<input type="text"/>	Angry   None of this feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal of this feeling
<input type="text"/>	Annoyed   None of this feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal of this feeling
<input type="text"/>	Aggravated   None of this feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A great deal of this feeling

Have you downloaded the COVID-19 app if it is available in your country?

Yes  
 No

NEXT PAGE

The next series of questions are 11 questions about you. To indicate the extent to which the following statements represents you, I would like you to tick a box from 1 to 7 ranging from strongly disagree or strongly agree.

I become frustrated when I am unable to make free and independent decisions.

Strongly disagree |        | Strongly agree

I become angry when my freedom of choice is restricted.

Strongly disagree |        | Strongly agree

It irritates me when someone points out things which are obvious to me.

Strongly disagree |        | Strongly agree

Regulations trigger a sense of resistance in me.

Strongly disagree |        | Strongly agree

I find contradicting others stimulating.

Strongly disagree |        | Strongly agree

When something is prohibited, I usually think "that's exactly what I am going to do."

Strongly disagree |        | Strongly agree

I resist the attempts of others to influence me.

Strongly disagree |        | Strongly agree

It makes me angry when another person is held up as a model for me to follow.

Strongly disagree |        | Strongly agree

When someone forces me to do something, I feel like doing the opposite.

Strongly disagree |        | Strongly agree

I consider advice from others to be an intrusion.

Strongly disagree |        | Strongly agree

Advice and recommendation induce me to do just the opposite.

Strongly disagree |        | Strongly agree



Please indicate to what extent you trust the government to always do the right thing for the people:

Strongly against |      | Strongly in favour

Please rate the text you read earlier from 1 to 8 for each bipolar adjective below:

Unbelievable	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	Believable
Amateur	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	Professional
Untrustworthy	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	Trustworthy

[PREVIOUS PAGE](#) [NEXT PAGE](#)

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**Which gender do you identify with?**

Male

Female

**Type in your age:**

**What is your highest achieved education?**

Primary school

Lower secondary school

Upper secondary school

Bachelor's

Master's

Doctor of Philosophy

Other

**What is your country of origin?**

**What is your nationality?**

[PREVIOUS PAGE](#) [SUBMIT](#)

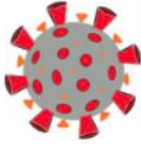
## Appendix 5: The Manipulation Check in English

Please read the following text carefully as the questions in the survey are based on it.

### Download the COVID-19 disease spread app to protect yourself!

A disease spread app aims to limit a pandemic's spread, such as COVID-19. The apps track infected individuals to warn users of being or having been close to an infected.

Privacy Policies:  
The COVID-19 disease spread app collects information on whom is infected and your locations and movements over time. Your information is often collected for the following purposes:



- To improve app functionality for your benefit.
- To warn you whether you have been close to somebody infected or warn your close ones that you are infected.
- Advance research for potentially your own benefit.

Also, your privacy is maintained in the following ways:

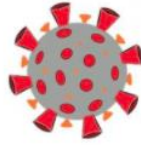
- Your locations and movements are hidden for other users.
- You are anonymized.
- Your shared information is kept safe.
- Use of Bluetooth to collect anonymous information about you.

Please read the following text carefully as the questions in the survey are based on it.

### Download the COVID-19 disease spread app to protect yourself!

A disease spread app aims to limit a pandemic's spread, such as COVID-19. The apps track infected individuals to warn users of being or having been close to an infected.

Privacy Policies:  
The COVID-19 disease spread app collects information on whom is infected and your locations and movements over time. Your information is often collected for the following purposes:



- To improve app functionality for your benefit.
- To warn you whether you have been close to somebody infected or warn your close ones that you are infected.
- Advance research for potentially your own benefit.

Also, your privacy is maintained in the following ways:

- Your locations and movements are hidden for other users.
- You are anonymized.
- Your shared information is kept safe.
- Use of Bluetooth to collect anonymous information about you.

How likely are you to adopt the app in the near future if it is available to you? Please choose a % in the slider below. 0% means I would certainly not download this app, and 100% means I would certainly download this app.

0      10      20      30      40      50      60      70      80      90      100  
%

Adopting this app is (choose a box from 1 to 7 for each bipolar adjective below):

	Foolish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Wise
	Bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Good
	Unfavorable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Favorable
	Negative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Positive
	Undesirable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Desirable
	Unnecessary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Necessary
	Detrimental	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Beneficial

To what extent do you feel the text promoted personal benefits or common good benefits for a disease spread app such as COVID-19 apps? Rate in the scale from 1 to 7 below.

Promoting personal benefits |        | Promoting benefits for the common good

→

Please indicate to what extent you trust the government to always do the right thing for the people:

Strongly against |      | Strongly in favour

Which gender do you identify with?

Male  
 Female

Type in your age:

What is your country of origin?

What is your nationality?

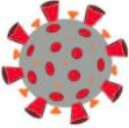
## Appendix 6: The Manipulation Check in Norwegian

Vennligst les følgende tekst nøye siden spørsmålene i resten av undersøkelsen er basert på denne.

### Last ned COVID-19 sykdomsspredningsappen for å beskytte andre!

Hensikten til en sykdomsspredningsapp er å begrense en pandemis spredning, for eksempel COVID-19. Appen sporer smittede for å varsle brukere om å være eller ha vært nærme den smittede.

Personvernsvilkår:  
 COVID-19 sykdomsspredningsappen samler inn informasjon om hvem som er smittet og samfunnets lokasjoner og bevegelser over tid. Informasjonen deres er ofte samlet inn for følgende formål:



- Å forbedre app-funksjonalitet for samfunnets fordel.
- Å varsle samfunnsmedlemmer om de har vært nærme noen smittede eller varsle andre at en er smittet.
- Bidra til forskning for potensielt samfunnets fordel.

I tillegg er samfunnets personven ivarett på følgende måter:

- Samfunnets lokasjoner og bevegelser er skjult for andre brukere.
- Samfunnsmedlemmer er anonyme.
- Samfunnets delte informasjon holdes trygg.
- Bruk av Bluetooth til å samle inn anonym informasjon om samfunnet.

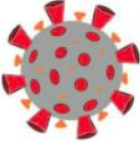
---

Vennligst les følgende tekst nøye siden spørsmålene i resten av undersøkelsen er basert på denne.

### Last ned COVID-19 sykdomsspredningsappen for å beskytte deg selv!

Hensikten til en sykdomsspredningsapp er å begrense en pandemis spredning, for eksempel COVID-19. Appen sporer smittede for å varsle brukere om å være eller ha vært nærme den smittede.

Personvernsvilkår:  
 COVID-19 sykdomsspredningsappen samler inn informasjon om hvem som er smittet og dine lokasjoner og bevegelser over tid. Informasjonen din er ofte samlet inn for følgende formål:



- Å forbedre app-funksjonalitet for din fordel.
- Å varsle deg om du har vært nærme noen smittede eller varsle dine nærmeste at du er smittet.
- Bidra til forskning for potensielt din egen fordel.

I tillegg er ditt personven ivarett på følgende måter:

- Dine lokasjoner og bevegelser er skjult for andre brukere.
- Du er anonym.
- Din delte informasjon holdes trygg.
- Bruk av Bluetooth til å samle inn anonym informasjon om deg.

---

Hvor sannsynlig er det at du tar i bruk appen i nær fremtid hvis den er tilgjengelig for deg? Velg i % med glidebryteren nedenfor. 0% betyr at jeg absolutt ikke ville laste ned denne appen, og 100% betyr at jeg absolutt ville laste ned denne appen.

0
10
20
30
40
50
60
70
80
90
100

%

---

**Å ta i bruk denne appen er (velg en boks fra 1 til 7 for hvert bipolare adjektiv under):**

Tåpelig	○ ○ ○ ○ ○ ○ ○ ○	Kjøkt
Dårlig	○ ○ ○ ○ ○ ○ ○ ○	Bra
Ugunstig	○ ○ ○ ○ ○ ○ ○ ○	Gunstig
Negativt	○ ○ ○ ○ ○ ○ ○ ○	Positivt
Uønsket	○ ○ ○ ○ ○ ○ ○ ○	Ønsket
Unødvendig	○ ○ ○ ○ ○ ○ ○ ○	Nødvendig
Skadelig	○ ○ ○ ○ ○ ○ ○ ○	Fordelaktig

---

I hvilken stor grad føler du at teksten øverst promoterer personlige fordeler eller samfunnsfordeler for en sykdomsspredningsapp som COVID-19-apper? Velg en passende boks i skalaen fra 1 til 7 nedenfor.

Promoterte personlige fordeler
○ ○ ○ ○ ○ ○ ○ ○
Promoterte samfunnsfordeler

→

Vennligst oppgi i hvilken grad du stoler på at staten alltid gjør det rette for folket:

Sterkt imot |      | Sterkt i faver

Hvilket kjønn identifiserer du deg med?

Mann  
 Kvinne

Skriv inn alderen din:

Hva er ditt opprinnelsesland?

Hva er nasjonaliteten din?

→